KONICA MINOLTA

CS-7

DIRECT DIGITIZER
CS-7

DICOM3.0 Conformance Statement

Manufacturer:
KONICA MINOLTA, INC.
1 Sakura-machi, Hino-shi, Tokyo, 191-8511, Japan

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1 INTRODUCTION

This document declares conformity of DIRECT DIGITIZER CS-7 (hereinafter, CS-7) to DICOM3.0.

1.1 Important Notes

This manual does not guarantee the proper function or performance of the interactive operation between the CS-7 and other interfaced devices. Please note the followings.

- Connection Test

When the CS-7 is used in connection with other devices, implement the connection test by referring to each DICOM conformance statement before start using the system, and confirm the data consistency and its stability. Specifically make sure to firmly confirm the consistency between the basic information of the Patient/Study/Image and the pixel size of the images.

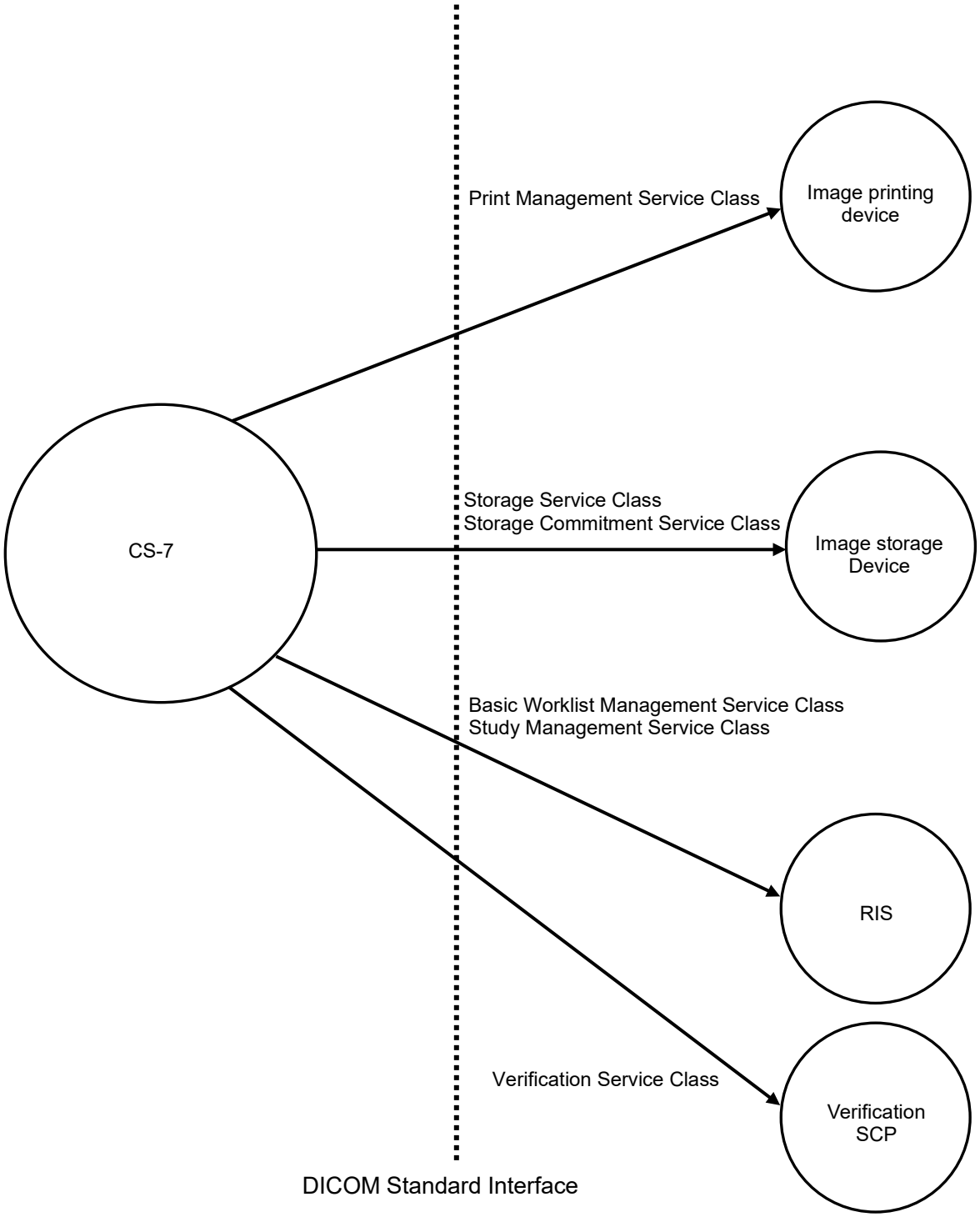
- Revision of DICOM Standard

The DICOM standard is annually revised due to diversified operation and introduction of new technology, etc. Please note this may cause a loss of compatibility or connectivity as the result of upgrade of DICOM module in CS-7 or connected module after the CS-7 has been installed.

2 IMPLEMENTATION MODEL

The CS-7 functions as an SCU for the Print Management Service Class.
The CS-7 functions as an SCU for the Storage Service Class.
The CS-7 functions as an SCU for the Basic Worklist Management Service Class.
The CS-7 functions as an SCU for the Study Management Service Class.
The CS-7 functions as an SCU for the Verification Service Class.
The CS-7 functions as an SCU for the Storage Commitment Service Class.

2.1 Application Data Flow Diagram



2.2 Functional Definitions of AE's

2.2.1 Print Management Service Class SCU

The CS-7 Print Management Service Class SCU operates as a communication process.
After receiving an association request for an external AE, it prints the image through the printer according to N-CREATE/N-SET/N-DELETE/N-ACTION/N-EVENT-REPORT.

2.2.2 Storage Service Class SCU

The CS-7 Storage Service Class SCU operates as a communication process.
After receiving an association request for an external AE, it stores the image and SR document in an image storage device via C-STORE.

2.2.3 Basic Worklist Management Service Class SCU

The CS-7 Basic Worklist Management Service Class SCU operates as a communication process. After receiving an association request for an external AE, it retrieves the Patient/Study Information from RIS according to C-FIND.

2.2.4 Study Management Service Class SCU

The CS-7 Study Management Service Class SCU operates as a communication process. After receiving an association request for an external AE, it sends the progress status of the study to RIS according to N-CREATE/N-SET/C-FIND.

2.2.5 Verification Service Class SCU

The CS-7 Verification Service Class SCU operates as a communication process. After receiving an association request for an external AE, it send the verification request for an external AE according to C-ECHO.

2.2.6 Storage Commitment Service Class SCU

The CS-7 Storage Commitment Service Class SCU operates as a communication process.
After receiving an association acceptance for an external AE, it request the image storage commitment through the image storage device according to N-ACTION/N-EVENT-REPORT.
N-ACTION and E-EVENT-REPORT communicate via separate associations.

2.3 Sequencing of Real World Activities

Sequencing of real world activities is not supported.

3 AE Specifications

3.1 CS-7 Print Management Service Class SCU Specifications

As a Print Management Service Class SCU, the CS-7 supports the following SOP classes.

SOP class name	SOP class UID
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23

3.1.1 Association Establishment Policies

Conditions for establishing association are described below.

3.1.1.1 General

The CS-7 Print Management Service Class SCU recognizes and uses the following application context name.

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

The initial and maximum PDU size is 64 KB.

3.1.1.2 Number of Associations

The CS-7 Print Management Service Class SCU issues a single association request at one time for the external AE that is implemented as a separate device.

3.1.1.3 Asynchronous Nature

Within the association, only the hardcopy image is handled. Asynchronous processing is not supported.

3.1.1.4 Implementation Identifying Information

Description	Value
Implementation Class UID	The Instance UIDs for Basic Film Session, Basic Film Box, and Basic Grayscale Image Box issued by SCP are used.
Implementation Version Name	KM_CS7_1.00

3.1.2 Real World Activities

3.1.2.1 Associated Real World Activity

The relevant activity in the real world is to send the image and its various parameters to the printer for the printout of the image on the film.

3.1.2.2 Presentation Context Tables

The following presentation contexts will be proposed as required.

Abstract syntax			
Name	UID	Role	Extended Negotiation
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	SCU	None
Presentation LUT SOP Class	1.2.840.10008.5.1.1.23	SCU	None

Transfer syntax	
Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2

3.1.2.3 Basic Film Session SOP Class

This model conforms with the Basic Film Session SOP Class.
The CS-7 uses the DIMSE services for film print on an imager (SCP).

Behavior: For SOP instances matching the Basic Film Session attribute list, the CS-7 executes the DIMSE services listed in the table below.
The CS-7 recognizes the DIMSE service response status and takes appropriate action depending on whether the service terminated normally or not.

DIMSE service request	Usage SCU/SCP
N-CREATE	M/M
N-SET	U/M
N-DELETE	U/M
N-ACTION	U/U

Basic Film Session attribute list (N-CREATE/N-SET)

Tag	Attribute Name	VR	VM	Usage
(2000, 0010)	Number of Copies	IS	1	U/M
(2000, 0020)	Print Priority	CS	1	U/M
(2000, 0030)	Medium Type	CS	1	U/M
(2000, 0040)	Film Destination	CS	1	U/M

3.1.2.4 Basic Film Box SOP Class

This model conforms with the Basic Film Box SOP Class.
The CS-7 uses the DIMSE services for film print on an imager (SCP).
If necessary, Private Data are output.

Behavior: For SOP instances matching the Basic Film Box attribute list, the CS-7 executes the DIMSE services listed in the table below.
The CS-7 recognizes the DIMSE service response status and takes appropriate action depending on whether the service terminated normally or not.

DIMSE service request	Usage SCU/SCP
N-CREATE	M/M
N-ACTION	M/M
N-DELETE	U/M
N-SET	U/U

Basic Film Box attribute list (N-CREATE/N-SET)

Tag	Attribute Name	VR	VM	Usage
(2010,0010)	Image Display Format	ST	1	M/M
(2010,0500)	Referenced Film Session Sequence	SQ	1	M/M
>(0008,1150)	Referenced SOP Class UID	UI	1	M/M
>(0008,1155)	Referenced SOP Instance UID	UI	1	M/M
(2010,0510)	Referenced Image Box Sequence	SQ	1	-/M
>(0008,1150)	Referenced SOP Class UID	UI	1	-/M
>(0008,1155)	Referenced SOP Instance UID	UI	1	-/M
(2010,0040)	Film Orientation	CS	1	U/M
(2010,0050)	Film Size ID	CS	1	U/M
(2010,0060)	Magnification Type	CS	1	U/M
(2010,0130)	Max Density	US	1	U/M
(2010,0150)	Configuration Information	ST	1	U/M
(2050,0500)	Referenced Presentation LUT Sequence	SQ	1	U/MC (Required if Presentation LUT is supported.)
>(0008,1150)	Referenced SOP Class UID	UI	1	U/MC (Required if a LUT sequence item is present.)
>(0008,1155)	Referenced SOP Instance UID	UI	1	U/MC (Required if a LUT sequence item is present.)
(2010,0030)	Annotation Display Format ID	CS	1	U/U
(2010,0080)	Smoothing Type	CS	1	U/U
(2010,0100)	Border Density	CS	1	U/U
(2010,0110)	Empty Image Density	CS	1	U/U
(2010,0120)	Min Density	US	1	U/U
(2010,0140)	Trim	US	1	U/U
(2010,015E)	Illumination	US	1	U/MC (Required if Presentation LUT is supported.)
(2010,0160)	Reflected Ambient Light	US	1	U/MC (Required if Presentation LUT is supported.)

* (2010,0150) The Configuration Information is given as "KC_LUT=i" (i: LUT number).
* (2010,0030) The Annotation Display Format ID is given as a combination of the character codes "P1" (Portrait), "L1" (Landscape), "TM" (Time), "CC" (Copy Count), "ID" (Modality ID), and "MS" (Message), joined with "_".

Private data				
Tag	Attribute Name	VR	VM	Type
(2011,0010)	Private Creator	CS	1	3
(2011,10xx)	Private Data			

3.1.2.5 Basic Grayscale Image Box SOP Class

This model conforms with the Basic Grayscale Image Box SOP Class.
The CS-7 uses the DIMSE services for film print on an imager (SCP).

Behavior: For SOP instances matching the Basic Grayscale Image attribute list, the CS-7 executes the DIMSE services listed in the table below.
The CS-7 recognizes the DIMSE service response status and takes appropriate action depending on whether the service terminated normally or not.

DIMSE service request	Usage SCU/SCP
N-SET	M/M

Basic Grayscale Image Box attribute list (N-SET)

Tag	Attribute Name	VR	VM	Usage
(2020,0010)	Image Position	US	1	M/M
(2020,0110)	Basic Grayscale Image Sequence	SQ	1	M/M
>(0028,0002)	Samples per Pixel	US	1	M/M
>(0028,0004)	Photometric Interpretation	CS	1	M/M
>(0028,0010)	Rows	US	1	M/M
>(0028,0011)	Columns	US	1	M/M
>(0028,0034)	Pixel Aspect Ratio	IS	2	MC/M (Required if aspect ratio is not 1/1.)
>(0028,0100)	Bits Allocated	US	1	M/M
>(0028,0101)	Bits Stored	US	1	M/M
>(0028,0102)	High Bit	US	1	M/M
>(0028,0103)	Pixel Representation	US	1	M/M
>(7FE0,0010)	Pixel Data	OW or OB	1	M/M
(2020,0020)	Polarity	CS	1	U/M
(2020,0030)	Requested Image Size	DS	1	U/U
(2020,0040)	Requested Decimate/Crop Behavior	CS	1	U/U

3.1.2.6 Printer SOP Class

This model conforms with the Printer SOP Class.
The CS-7 uses the DIMSE services for obtaining the device status of the imager (SCP).
If necessary, Private Data are output.

Behavior: For SOP instances matching the Printer attribute list, the CS-7 executes the DIMSE services listed in the table below.
The CS-7 recognizes the DIMSE service response status and takes appropriate action depending on whether the service terminated normally or not.

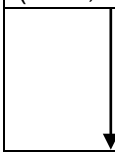
DIMSE service request	Usage SCU/SCP
N-EVENT-REPORT	M/M
N-GET	U/M

Printer SOP attribute list (N-EVENT-REPORT)

Tag	Attribute Name	VR	VM	Usage
(2000,0040)	Film Destination	CS	1	U/M
(2110,0020)	Printer Status Info	CS	1	U/U
(2110,0030)	Printer Name	LO	1	U/U

Printer SOP attribute list (N-GET)

Tag	Attribute Name	VR	VM	Usage
(2110,0010)	Printer Status	CS	1	U/M
(2110,0020)	Printer Status Info	CS	1	U/M
(2110,0030)	Printer Name	LO	1	U/U
(0008,0070)	Manufacturer	LO	1	U/U
(0008,1090)	Manufacturer's Model Name	LO	1	U/U
(0018,1000)	Device Serial Number	LO	1	U/U
(0018,1020)	Software Version(s)	LO	1	U/U
(0018,1200)	Date of Last Calibration	DA	1-n	U/U
(0018,1201)	Time of Last Calibration	TM	1-n	U/U

Private data				
Tag	Attribute Name	VR	VM	Type
(2011,0010)	Private Creator	CS	1	3
(2011,10xx)	Private Data			
				

3.1.2.7 Presentation LUT SOP Class

This model conforms with the Presentation LUT SOP Class.
The CS-7 uses the DIMSE services for film print on an imager (SCP).

Behavior: For SOP instances matching the Presentation LUT attribute list, the CS-7 executes the DIMSE services listed in the table below.
The CS-7 recognizes the DIMSE service response status and takes appropriate action depending on whether the service terminated normally or not.

DIMSE service request	Usage SCU/SCP
N-CREATE	M/M
N-DELETE	U/M

Presentation LUT attribute list (N-CREATE)

Tag	Attribute Name	VR	VM	Usage
(2050,0010)	Presentation LUT Sequence	SQ	1	MC/M (Required if Presentation LUT format does not exist. Shall not be present otherwise.)
>(0028,3002)	LUT Descriptor	SS	3	MC/M (Required if Presentation LUT sequence exists.)
>(0028,3003)	LUT Explanation	LO	1	U/U (Required if Presentation LUT sequence exists.)
>(0028,3006)	LUT Data	SS	1-n	MC/M (Required if Presentation LUT sequence exists.)

3.2 CS-7 Storage Service Class SCU Specifications

The CS-7 supports the following SOP classes as Storage Service Class SCU.

SOP Class Name	SOP Class UID
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Digital X-Ray Image Storage -For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67

3.2.1 Association Establishment Policies

Conditions for establishing association are described below.

3.2.1.1 General

The CS-7 Storage Service Class SCU recognizes and uses the following application context name.

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

The initial and maximum PDU size is 64 KB.

3.2.1.2 Number of Associations

The CS-7 Storage Service Class SCU issues a single association request at one time for the external AE that is implemented as a separate device.

3.2.1.3 Asynchronous Nature

Only a single image and a single SR document are processed per association. Asynchronous processing is not supported.

3.2.1.4 Implementation Identifying Information

Description	Value
Implementation Class UID	See explanation of Instance UID below
Implementation Version Name	KM_CS7_1.00

The SOP Instance UID is as follows.
1.2.392.200036.9107.[Device].[Serial No.].[yyyymmdd].[hhmmss].[10+Unique No.]

The Study Instance UID is as follows.
1.2.392.200036.9107.[Device].[Serial No].[11+Study No.]

The Series Instance UID is as follows.
1.2.392.200036.9107.[Device].[Serial No].[Study No.].[12+Series No.]

Note) [Device] : Sending device type 307
[Serial No.] : Device serial number
[yyyymmdd] : Date
[hhmmss] : Time
[Study No.] : Study ID
[Series No.] : Series number
[Unique No.] : Unique number issued within device

3.2.2 Real World Activities

3.2.2.1 Associated Real World Activity

The related activity in the real world is the issuing of the image and SR document C-STORE request to the Storage Service Class SCP.

3.2.2.2 Presentation Context Tables

The following presentation contexts will be proposed as required.

Abstract syntax			
Name	UID	Role	Extended Negotiation
Computed Radiography Image Storage SOP	1.2.840.10008.5.1.4.1.1.1	SCU	None
Digital X-Ray Image Storage -For Presentation	1.2.840.10008.5.1.4.1.1.1.1	SCU	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	SCU	None
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	SCU	None

Transfer syntax	
Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1
Explicit VR Big Endian	1.2.840.10008.1.2.2
JPEG Lossless	1.2.840.10008.1.2.4.70

3.2.2.3 CR Image Storage SOP Class

This model conforms with the CR Image Storage SOP Class.
The CS-7 uses C-STORE to store image data on an image storage device (SCP).
If necessary, Private Data are output.

Behavior: For SOP instances matching the CR Image IOD request, the CS-7 executes the C-STORE DIMSE service.
The CS-7 recognizes the C-STORE response status and takes appropriate action depending on whether the service terminated normally or not.

[Important] Images received from digital radiography equipment can be sent as CR images by using the CS-7 communication settings (service engineer work). Be sure to thoroughly check the compatibility with other connected equipment at the time of use.

[Important] When sending images obtained from CR equipment and images obtained from digital radiography equipment from the CS-7, either CR images or DX images must be used.

CR Image IOD Modules

IE	Module	Usage
Patient	Patient	M
Study	General Study	M
	Patient Study	U
Series	General Series	M
	CR Series	M
Device	General Device	M
Image	General Image	M
	Image Pixel	M
	Contrast Medium/Bolus	C
	CR Image	M
	Overlay Plane	U
	Curve	U
	Modality LUT	U
	VOI LUT	U
	SOP Common	M

Patient				
Tag	Attribute Name	VR	VM	Type
(0010,0010)	Patient's Name	PN	1	2
(0010,0020)	Patient ID	LO	1	2
(0010,0030)	Patient's Birth Date	DA	1	2
(0010,0040)	Patient's Sex	CS	1	2
(0010,0032)	Patient's Birth Time	TM	1	3
(0010,1000)	Other Patient IDs	LO	1	3
(0010,1001)	Other Patient Names	PN	1	3
(0010,2160)	Ethnic Group	SH	1	3
(0010,4000)	Patient Comments	LT	1	3

General Study				
Tag	Attribute Name	VR	VM	Type
(0020,000D)	Study Instance UID	UI	1	1
(0008,0020)	Study Date	DA	1	2
(0008,0030)	Study Time	TM	1	2
(0008,0090)	Referring Physician's Name	PN	1	2
(0020,0010)	Study ID	SH	1	2
(0008,0050)	Accession Number	SH	1	2
(0008,1030)	Study Description	LO	1	3
(0008,1048)	Physician(s) of Record	PN	1	3
(0008,1060)	Name of Physician(s) Reading Study	PN	1	3
(0032,1033)	Requesting Department	LO	1	3

Patient Study				
Tag	Attribute Name	VR	VM	Type
(0008,1080)	Admitting Diagnoses Description	LO	1	3
(0010,1010)	Patient's Age	AS	1	3
(0010,1020)	Patient's Size	DS	1	3
(0010,1030)	Patient's Weight	DS	1	3
(0010,2180)	Occupation	SH	1	3
(0010,21B0)	Additional Patient History	LT	1	3

General Series				
Tag	Attribute Name	VR	VM	Type
(0008,0060)	Modality	CS	1	1
(0008,103E)	Series Description	LO	1	3
(0020,000E)	Series Instance UID	UI	1	1
(0020,0011)	Series Number	IS	1	2
(0020,0060)	Laterality	CS	1	2C
(0008,1050)	Performing Physician's Name	PN	1	3
(0018,1030)	Protocol Name	LO	1	3
(0008,1070)	Operator's Name	PN	1	3
(0018,0015)	Body Part Examined	CS	1	3

General Series				
Tag	Attribute Name	VR	VM	Type
(0040,0275)	Request Attributes Sequence	SQ	1	3
>(0040,1001)	Requested Procedure ID	SH	1	1C
>(0040,0009)	Scheduled Procedure Step ID	SH	1	1C
>(0040,0007)	Scheduled Procedure Step Description	LO	1	3
>(0040,0008)	Scheduled Protocol Code Sequence	SQ	1	3
>>(0008,0100)	Code Value	SH	1	1C
>>(0008,0102)	Coding Scheme Designator	SH	1	1C
>>(0008,0104)	Code Meaning	LO	1	1C
(0040,0244)	Performed Procedure Step Start Date	DA	1	3
(0040,0245)	Performed Procedure Step Start Time	TM	1	3
(0040,0254)	Performed Procedure Step Description	LO	1	3
(0040,0260)	Performed Protocol Code Sequence	SQ	1	3
>(0008,0100)	Code Value	SH	1	1C
>(0008,0102)	Coding Scheme Designator	SH	1	1C
>(0008,0104)	Code Meaning	LO	1	1C

CR Series				
Tag	Attribute Name	VR	VM	Type
(0018,0015)	Body Part Examined	CS	1	2
(0018,5101)	View Position	CS	1	2
(0018,1160)	Filter Type	SH	1	3
(0018,1190)	Focal Spot(s)	DS	1	3
(0018,1260)	Plate Type	SH	1	3
(0018,1261)	Phosphor Type	LO	1	3

General Device				
Tag	Attribute Name	VR	VM	Type
(0008,0070)	Manufacturer	LO	1	2
(0008,0080)	Institution Name	LO	1	3
(0008,0081)	Institution Address	ST	1	3
(0008,1010)	Station Name	SH	1	3
(0008,1040)	Institutional Department Name	LO	1	3
(0008,1090)	Manufacturer's Model Name	LO	1	3
(0018,1000)	Device Serial Number	LO	1	3
(0018,1020)	Software Version(s)	LO	4	3
(0018,1200)	Date of Last Calibration	DA	1	3
(0018,1201)	Time of Last Calibration	TM	1	3

General Image				
Tag	Attribute Name	VR	VM	Type
(0020,0013)	Instance Number	IS	1	2
(0020,0020)	Patient Orientation	CS	2	2C
(0008,0023)	Content Date	DA	1	2C
(0008,0033)	Content Time	TM	1	2C
(0008,0008)	Image Type	CS	2	3
(0020,0012)	Acquisition Number	IS	1	3
(0008,2112)	Source Image Sequence	SQ	1	3
>(0008,1150)	Referenced SOP Class UID	UI	1	1C
>(0008,1155)	Referenced SOP Instance UID	UI	1	1C
(0020,4000)	Image Comments	LT	1	3
(0028,0300)	Quality Control Image	CS	1	3
(0028,0301)	Burned In Annotation	CS	1	3
(0028,2110)	Lossy Image Compression	CS	1	3

Image Pixel				
Tag	Attribute Name	VR	VM	Type
(0028,0002)	Samples per Pixel	US	1	1
(0028,0004)	Photometric Interpretation	CS	1	1
(0028,0010)	Rows	US	1	1
(0028,0011)	Columns	US	1	1
(0028,0030)	Pixel Spacing	DS	2	3
(0028,0100)	Bits Allocated	US	1	1
(0028,0101)	Bits Stored	US	1	1
(0028,0102)	High Bit	US	1	1
(0028,0103)	Pixel Representation	US	1	1
(7FE0,0010)	Pixel Data	OW	1	1

[Important] When the tag “Imager Pixel Spacing (0018,1164)” or “Pixel Spacing (0028,0030)” is used on the other connecting device for the purpose of measurement, make sure to confirm the consistency in advance.
Specifically when reducing the size of the image, pay attention that the measured value might be corrected according to the reduction ratio.

Contrast/Bolus				
Tag	Attribute Name	VR	VM	Type
(0018,0010)	Contrast/Bolus Agent	LO	1	2
(0018,1040)	Contrast/Bolus Route	LO	1	3
(0018,1041)	Contrast/Bolus Volume	DS	1	3
(0018,1042)	Contrast/Bolus Start Time	TM	1	3
(0018,1043)	Contrast/Bolus Stop Time	TM	1	3
(0018,1044)	Contrast/Bolus Total Dose	DS	1	3
(0018,1046)	Contrast Flow Rate(s)	DS	1	3
(0018,1047)	Contrast Flow Duration(s)	DS	1	3
(0018,1048)	Contrast/Bolus Ingredient	CS	1	3
(0018,1049)	Contrast/Bolus Ingredient Concentration	DS	1	3

CR Image				
Tag	Attribute Name	VR	VM	Type
(0028,0004)	Photometric Interpretation	CS	1	1
(0018,0060)	KVP	DS	1	3
(0018,1004)	Plate ID	LO	1	3
(0018,1110)	Distance Source to Detector	DS	1	3
(0018,1111)	Distance Source to Patient	DS	1	3
(0018,1150)	Exposure Time	IS	1	3
(0018,1151)	X-ray Tube Current	IS	1	3
(0018,1152)	Exposure	IS	1	3
(0018,1153)	Exposure in µAs	IS	1	3
(0018,1164)	Imager Pixel Spacing	DS	2	3
(0018,1402)	Cassette Orientation	CS	1	3
(0018,1403)	Cassette Size	CS	1	3
(0018,6000)	Sensitivity	DS	1	3
(0018,1411)	Exposure Index	DS	1	3
(0018,1412)	Target Exposure Index	DS	1	3
(0018,1413)	Deviation Index	DS	1	3

[Important] When the tag “Imager Pixel Spacing (0018,1164)” or “Pixel Spacing (0028,0030)” is used on the other connecting device for the purpose of measurement, make sure to confirm the consistency in advance.
Specifically when reducing the size of the image, pay attention that the measured value might be corrected according to the reduction ratio.

Modality LUT				
Tag	Attribute Name	VR	VM	Type
(0028,1052)	Rescale Intercept	DS	1	1C
(0028,1053)	Rescale Slope	DS	1	1C
(0028,1054)	Rescale Type	LO	1	1C

VOI LUT				
Tag	Attribute Name	VR	VM	Type
(0028,3010)	VOI LUT Sequence	SQ	1	3
>(0028,3002)	LUT Descriptor	US	3	1C
>(0028,3006)	LUT Data	US	4095	1C
(0028,1050)	Window Center	DS	1	3
(0028,1051)	Window Width	DS	1	1C

SOP Common				
Tag	Attribute Name	VR	VM	Type
(0008,0016)	SOP Class UID	UI	1	1
(0008,0018)	SOP Instance UID	UI	1	1
(0008,0005)	Specific Character Set	CS	2-3	1C

Private Data				
Tag	Attribute Name	VR	VM	Type
(0031,0010)	Private Creator	CS	1	3
(0031,10FF)	Private Data Sequence	SQ	1	1C
	Private Data			

3.2.2.4 DX Image Storage SOP Class

This model conforms with the DX Image SOP Class for Presentation SOP Class.
The CS-7 uses C-STORE to store image data on an image storage device (SCP).
If necessary, Private Data are output.

Behavior: For SOP instances matching the DX Image IOD request, the CS-7 executes the C-STORE DIMSE service.
The CS-7 recognizes the C-STORE response status and takes appropriate action depending on whether the service terminated normally or not.

DX Image IOD Modules

IE	Module	Usage
Patient	Patient	M
	Specimen Identification	U
Study	General Study	M
	Patient Study	U
Series	General Series	M
	DX Series	M
Reference Coordinates	Reference Coordinates	U
Device	General Device	M
Image	General Image	M
	Image Pixel	M
	Contrast/Bolus	U
	Display Shutter	U
	Device	U
	Therapy	U
	DX Anatomy Imaged	M
	DX Image	M
	DX Detector	M
	X-Ray Collimator	U
	DX Positioning	U
	X-Ray Tomo Acquisition	U
	X-Ray Acquisition Dose	U
	X-Ray Generation	U
	X-Ray Filtration	U
	X-Ray Grid	U
	Overlay Plane	Required if graphic annotation is present.
	Curve	U
	VOI LUT	Required if Presentation Intent Type is FOR PRESENTATION. Shall not be present otherwise.
	Image Histogram	U
	Acquisition Context	M
	SOP Common	M

[Important] When sending images obtained from CR equipment and images obtained from digital radiography equipment from the CS-7, either CR images or DX images must be used.

Patient				
Tag	Attribute Name	VR	VM	Type
(0010,0010)	Patient's Name	PN	1	2
(0010,0020)	Patient ID	LO	1	2
(0010,0030)	Patient's Birth Date	DA	1	2
(0010,0040)	Patient's Sex	CS	1	2
(0010,0032)	Patient's Birth Time	TM	1	3
(0010,1000)	Other Patient IDs	LO	1	3
(0010,1001)	Other Patient Names	PN	1	3
(0010,2160)	Ethnic Group	SH	1	3
(0010,4000)	Patient Comments	LT	1	3

General Study				
Tag	Attribute Name	VR	VM	Type
(0020,000D)	Study Instance UID	UI	1	1
(0008,0020)	Study Date	DA	1	2
(0008,0030)	Study Time	TM	1	2
(0008,0090)	Referring Physician's Name	PN	1	2
(0020,0010)	Study ID	SH	1	2
(0008,0050)	Accession Number	SH	1	2
(0008,1030)	Study Description	LO	1	3
(0008,1048)	Physician(s) of Record	PN	1	3
(0008,1060)	Name of Physician(s) Reading Study	PN	1	3
(0032,1033)	Requesting Department	LO	1	3

Patient Study				
Tag	Attribute Name	VR	VM	Type
(0008,1080)	Admitting Diagnoses Description	LO	1	3
(0010,1010)	Patient's Age	AS	1	3
(0010,1020)	Patient's Size	DS	1	3
(0010,1030)	Patient's Weight	DS	1	3
(0010,2180)	Occupation	SH	1	3
(0010,21B0)	Additional Patient History	LT	1	3

General Series				
Tag	Attribute Name	VR	VM	Type
(0008,0060)	Modality	CS	1	1
(0008,103E)	Series Description	LO	1	3
(0020,000E)	Series Instance UID	UI	1	1
(0020,0011)	Series Number	IS	1	2
(0020,0060)	Laterality	CS	1	2C
(0008,1050)	Performing Physician's Name	PN	1	3
(0018,1030)	Protocol Name	LO	1	3
(0008,1070)	Operator's Name	PN	1	3
(0018,0015)	Body Part Examined	CS	1	3

General Series				
Tag	Attribute Name	VR	VM	Type
(0040,0275)	Request Attributes Sequence	SQ	1	3
>(0040,1001)	Requested Procedure ID	SH	1	1C
>(0040,0009)	Scheduled Procedure Step ID	SH	1	1C
>(0040,0007)	Scheduled Procedure Step Description	LO	1	3
>(0040,0008)	Scheduled Protocol Code Sequence	SQ	1	3
>>(0008,0100)	Code Value	SH	1	1C
>>(0008,0102)	Coding Scheme Designator	SH	1	1C
>>(0008,0104)	Code Meaning	LO	1	1C
(0040,0253)	Performed Procedure Step ID	SH	1	3
(0040,0244)	Performed Procedure Step Start Date	DA	1	3
(0040,0245)	Performed Procedure Step Start Time	TM	1	3
(0040,0254)	Performed Procedure Step Description	LO	1	3
(0040,0260)	Performed Protocol Code Sequence	SQ	1	3
>(0008,0100)	Code Value	SH	1	1C
>(0008,0102)	Coding Scheme Designator	SH	1	1C
>(0008,0104)	Code Meaning	LO	1	1C

DX Series				
Tag	Attribute Name	VR	VM	Type
(0008,0060)	Modality	CS	1	1
(0008,0068)	Presentation Intent Type	CS	1	1

General Device				
Tag	Attribute Name	VR	VM	Type
(0008,0070)	Manufacturer	LO	1	2
(0008,0080)	Institution Name	LO	1	3
(0008,0081)	Institution Address	ST	1	3
(0008,1010)	Station Name	SH	1	3
(0008,1040)	Institutional Department Name	LO	1	3
(0008,1090)	Manufacturer's Model Name	LO	1	3
(0018,1000)	Device Serial Number	LO	1	3
(0018,1020)	Software Version(s)	LO	4	3
(0018,1200)	Date of Last Calibration	DA	1	3
(0018,1201)	Time of Last Calibration	TM	1	3

General Image				
Tag	Attribute Name	VR	VM	Type
(0020,0013)	Instance Number	IS	1	2
(0020,0020)	Patient Orientation	CS	2	2C
(0008,0023)	Content Date	DA	1	2C
(0008,0033)	Content Time	TM	1	2C
(0008,0008)	Image Type	CS	2	3
(0020,0012)	Acquisition Number	IS	1	3
(0008,2112)	Source Image Sequence	SQ	1	3
>(0008,1150)	Referenced SOP Class UID	UI	1	1C
>(0008,1155)	Referenced SOP Instance UID	UI	1	1C
(0020,4000)	Image Comment	LT	1	3
(0028,0300)	Quality Control Image	CS	1	3
(0028,0301)	Burned In Annotation	CS	1	3
(0028,2110)	Lossy Image Compression	CS	1	3

Image Pixel				
Tag	Attribute Name	VR	VM	Type
(0028,0002)	Samples per Pixel	US	1	1
(0028,0004)	Photometric Interpretation	CS	1	1
(0028,0010)	Rows	US	1	1
(0028,0011)	Columns	US	1	1
(0028,0030)	Pixel Spacing	DS	2	3
(0028,0100)	Bits Allocated	US	1	1
(0028,0101)	Bits Stored	US	1	1
(0028,0102)	High Bit	US	1	1
(0028,0103)	Pixel Representation	US	1	1
(7FE0,0010)	Pixel Data	OW	1	1

[Important] When the tag “Imager Pixel Spacing (0018,1164)” or “Pixel Spacing (0028,0030)” is used on the other connecting device for the purpose of measurement, make sure to confirm the consistency in advance.
Specifically when reducing the size of the image, pay attention that the measured value might be corrected according to the reduction ratio.

Contrast/Bolus				
Tag	Attribute Name	VR	VM	Type
(0018,0010)	Contrast/Bolus Agent	LO	1	2
(0018,1040)	Contrast/Bolus Route	LO	1	3
(0018,1041)	Contrast/Bolus Volume	DS	1	3
(0018,1042)	Contrast/Bolus Start Time	TM	1	3
(0018,1043)	Contrast/Bolus Stop Time	TM	1	3
(0018,1044)	Contrast/Bolus Total Dose	DS	1	3
(0018,1046)	Contrast Flow Rate(s)	DS	1	3
(0018,1047)	Contrast Flow Duration(s)	DS	1	3
(0018,1048)	Contrast/Bolus Ingredient	CS	1	3
(0018,1049)	Contrast/Bolus Ingredient Concentration	DS	1	3

DX Anatomy Imaged				
Tag	Attribute Name	VR	VM	Type
(0020,0062)	Image Laterality	CS	1	1
(0008,2218)	Anatomic Region Sequence	SQ	1	2
>(0008,0100)	Code Value	SH	1	1C
>(0008,0102)	Coding Scheme Designator	SH	1	1C
>(0008,0104)	Code Meaning	LO	1	1C

DX Image				
Tag	Attribute Name	VR	VM	Type
(0008,0008)	Image Type	CS	1-n	1
(0028,0002)	Samples per Pixel	US	1	1
(0028,0004)	Photometric Interpretation	CS	1	1
(0028,0100)	Bits Allocated	US	1	1
(0028,0101)	Bits Stored	US	1	1
(0028,0102)	High Bit	US	1	1
(0028,0103)	Pixel Representation	US	1	1
(0028,1040)	Pixel Intensity Relationship	CS	1	1
(0028,1041)	Pixel Intensity Relationship Sign	SS	1	1
(0028,1052)	Rescale Intercept	DS	1	1
(0028,1053)	Rescale Slope	DS	1	1
(0028,1054)	Rescale Type	LO	1	1
(2050,0020)	Presentation LUT Shape	CS	1	1
(0028,2110)	Lossy Image Compression	CS	1	3
(0020,0020)	Patient Orientation	CS	2	2C
(0028,0301)	Burned In Annotation	CS	1	1
(0028,3010)	VOI LUT Sequence	SQ	1	1C
>(0028,3002)	LUT Descriptor	US	3	1C
>(0028,3006)	LUT Data	US	4096	1C
(0028,1050)	Window Center	DS	1	1C
(0028,1051)	Window Width	DS	1	1C

DX Detector				
Tag	Attribute Name	VR	VM	Type
(0018,7004)	Detector Type	CS	1	2
(0018,7005)	Detector Configuration	CS	1	3
(0018,700A)	Detector ID	SH	1	3
(0018,700C)	Date of Last Detector Calibration	DA	1	3
(0018,700E)	Time of Last Detector Calibration	TM	1	3
(0018,7010)	Exposures on Detector Since Last Calibration	IS	1	3
(0018,7011)	Exposures on Detector Since Manufactured	IS	1	3
(0018,7012)	Detector Time Since Last Exposure	DS	1	3
(0018,7016)	Detector Activation Offset From Exposure	DS	1	3
(0018,6000)	Sensitivity	DS	1	3
(0018,1147)	Field of View Shape	CS	1	3
(0018,1149)	Field of View Dimension(s)	IS	1-2	3
(0018,7030)	Field of View Origin	DS	2	1C
(0018,7032)	Field of View Rotation	DS	1	1C
(0018,7034)	Field of View Horizontal Flip	CS	1	1C
(0018,1164)	Imager Pixel Spacing	DS	2	1
(0018,7024)	Detector Active Shape	CS	1	3
(0018,7026)	Detector Active Dimension(s)	DS	1-2	3
(0018,7028)	Detector Active Origin	DS	2	3
(0018,1411)	Exposure Index	DS	1	3
(0018,1412)	Target Exposure Index	DS	1	3
(0018,1413)	Deviation Index	DS	1	3

[Important] When the tag “Imager Pixel Spacing (0018,1164)” or “Pixel Spacing (0028,0030)” is used on the other connecting device for the purpose of measurement, make sure to confirm the consistency in advance.
Specifically when reducing the size of the image, pay attention that the measured value might be corrected according to the reduction ratio.

X-Ray Collimator				
Tag	Attribute Name	VR	VM	Type
(0018,1700)	Collimator Shape	CS	1-3	1
(0018,1702)	Collimator Left Vertical Edge	IS	1	1C
(0018,1704)	Collimator Right Vertical Edge	IS	1	1C
(0018,1706)	Collimator Upper Horizontal Edge	IS	1	1C
(0018,1708)	Collimator Lower Horizontal Edge	IS	1	1C

DX Positioning				
Tag	Attribute Name	VR	VM	Type
(0018,5101)	View Position	CS	1	2
(0018,1111)	Distance Source to Patient	DS	1	3
(0018,1110)	Distance Source to Detector	DS	1	3
(0054,0220)	Field of View Code Sequence	SQ	1	3
>(0008,0100)	Code Value	SH	1	3
>(0008,0102)	Code Scheme Descriptor	SH	1	3
>(0008,0104)	Code Meaning	LO	1	3
>(0054,0222)	Field of View Modifier Code Sequence	SQ	1	3
>>(0008,0100)	Code Value	SH	1	3
>>(0008,0102)	Code Scheme Descriptor	SH	1	3
>>(0008,0104)	Code Meaning	LO	1	3
(0018,1508)	Positioning Device Type	CS	1	2

X-Ray Acquisition Dose				
Tag	Attribute Name	VR	VM	Type
(0018,0060)	KVP	DS	1	3
(0018,1151)	X-ray Tube Current	IS	1	3
(0018,1150)	Exposure Time	IS	1	3
(0018,1152)	Exposure	IS	1	3
(0018,1153)	Exposure in µAs	IS	1	3
(0018,1110)	Distance Source to Detector	DS	1	3
(0018,1111)	Distance Source to Patient	DS	1	3
(0040,0302)	Entrance Dose	US	1	3
(0040,0303)	Exposed Area	US	1-2	3
(0040,0306)	Distance Source to Entrance	DS	1	3
(0018,1191)	Anode Target Material	CS	1	3
(0018,7050)	Filter Material	CS	1-n	3
(0018,7052)	Filter Thickness Minimum	DS	1-n	3
(0018,7054)	Filter Thickness Maximum	DS	1-n	3
(0018,1156)	Rectification Type	CS	1	3
(0018,115E)	Image and Fluoroscopy Area Dose Product	DS	1	3
(0018,8150)	Exposure Time in µS	DS	1	3
(0018,8151)	X-ray Tube Current in µA	DS	1	3
(0018,1405)	Relative X-ray Dose	IS	1	3

X-Ray Generation				
Tag	Attribute Name	VR	VM	Type
(0018,0060)	KVP	DS	1	3
(0018,1151)	X-ray Tube Current	IS	1	3
(0018,1150)	Exposure Time	IS	1	3
(0018,1152)	Exposure	IS	1	3
(0018,1153)	Exposure in µAs	IS	1	3
(0018,7060)	Exposure Control Mode	CS	1	3
(0018,7064)	Exposure Status	CS	1	3
(0018,1190)	Focal Spot(s)	DS	1-n	3
(0018,1191)	Anode Target Material	CS	1	3
(0018,1156)	Rectification Type	CS	1	3
(0018,7065)	Phototimer Setting	DS	1	3
(0018,8150)	Exposure Time in µS	DS	1	3
(0018,8151)	X-ray Tube Current in µA	DS	1	3

X-Ray Filtration				
Tag	Attribute Name	VR	VM	Type
(0018,1160)	Filter Type	SH	1	3
(0018,7050)	Filter Material	CS	1-n	3
(0018,7052)	Filter Thickness Minimum	DS	1-n	3
(0018,7054)	Filter Thickness Maximum	DS	1-n	3

X-Ray Grid				
Tag	Attribute Name	VR	VM	Type
(0018,1166)	Grid	CS	1	3
(0018,7040)	Grid Absorbing Material	LT	1	3
(0018,7041)	Grid Spacing Material	LT	1	3
(0018,7042)	Grid Thickness	DS	1	3
(0018,7044)	Grid Pitch	DS	1	3
(0018,7046)	Grid Aspect Ratio	IS	2	3
(0018,704C)	Grid Focal Distance	DS	1	3

VOI LUT				
Tag	Attribute Name	VR	VM	Type
(0028,3010)	VOI LUT Sequence	SQ	1	3
>(0028,3002)	LUT Descriptor	US	3	1C
>(0028,3006)	LUT Data	US	4095	1C
(0028,1050)	Window Center	DS	1	3
(0028,1051)	Window Width	DS	1	1C

Acquisition Context				
Tag	Attribute Name	VR	VM	Type
(0040,0555)	Acquisition Context Sequence	SQ	1	2

SOP Common				
Tag	Attribute Name	VR	VM	Type
(0008,0016)	SOP Class UID	UI	1	1
(0008,0018)	SOP Instance UID	UI	1	1
(0008,0005)	Specific Character Set	CS	2-3	1C

Private Data				
Tag	Attribute Name	VR	VM	Type
(0031,0010)	Private Creator	CS	1	3
(0031,10FF)	Private Data Sequence	SQ	1	1C
↓	Private Data			
	↓			

3.2.2.5 MG Image Storage SOP Class

This model conforms to the MG Image SOP Class.
The CS-7 uses C-STORE to store image data on an image storage device (SCP).
If necessary, Private Data are output.

Behavior: For SOP instances matching the MG Image IOD request, the CS-7 executes the C-STORE DIMSE service. The CS-7 recognizes the C-STORE response status and takes appropriate action depending on whether the service terminated normally or not.

MG Image IOD Modules

IE	Module	Usage
Patient	Patient	M
	Specimen Identification	U
Study	General Study	M
	Patient Study	U
Series	General Series	M
	DX Series	M
	Mammography Series	M
Reference Coordinates	Reference Coordinates	U
Device	General Device	M
Image	General Image	M
	Image Pixel	M
	Contrast/Bolus	U
	Display Shutter	U
	Device	U
	Therapy	U
	DX Anatomy Imaged	M
	DX Image	M
	DX Detector	M
	X-Ray Collimator	U
	DX Positioning	U
	X-Ray Tomo Acquisition	U
	X-Ray Acquisition Dose	U
	X-Ray Generation	U
	X-Ray Filtration	U
	X-Ray Grid	U
	Mammography Image	M
	Overlay Plane	Required if graphic annotation is present.
	Curve	U
	VOI LUT	Required if Presentation Intent Type is FOR PRESENTATION. Shall not be present otherwise.
	Image Histogram	U
	Acquisition Context	M
	SOP Common	M

Patient				
Tag	Attribute Name	VR	VM	Type
(0010,0010)	Patient's Name	PN	1	2
(0010,0020)	Patient ID	LO	1	2
(0010,0030)	Patient's Birth Date	DA	1	2
(0010,0040)	Patient's Sex	CS	1	2
(0010,0032)	Patient's Birth Time	TM	1	3
(0010,1000)	Other Patient IDs	LO	1	3
(0010,1001)	Other Patient Names	PN	1	3
(0010,2160)	Ethnic Group	SH	1	3
(0010,4000)	Patient Comments	LT	1	3

General Study				
Tag	Attribute Name	VR	VM	Type
(0020,000D)	Study Instance UID	UI	1	1
(0008,0020)	Study Date	DA	1	2
(0008,0030)	Study Time	TM	1	2
(0008,0090)	Referring Physician's Name	PN	1	2
(0020,0010)	Study ID	SH	1	2
(0008,0050)	Accession Number	SH	1	2
(0008,1030)	Study Description	LO	1	3
(0008,1048)	Physician(s) of Record	PN	1	3
(0008,1060)	Name of Physician(s) Reading Study	PN	1	3
(0032,1033)	Requesting Service	LO	1	3

Patient Study				
Tag	Attribute Name	VR	VM	Type
(0008,1080)	Admitting Diagnoses Description	LO	1	3
(0010,1010)	Patient's Age	AS	1	3
(0010,1020)	Patient's Size	DS	1	3
(0010,1030)	Patient's Weight	DS	1	3
(0010,2180)	Occupation	SH	1	3
(0010,21B0)	Additional Patient History	LT	1	3

General Series				
Tag	Attribute Name	VR	VM	Type
(0008,0060)	Modality	CS	1	1
(0008,103E)	Series Description	LO	1	3
(0020,000E)	Series Instance UID	UI	1	1
(0020,0011)	Series Number	IS	1	2
(0020,0060)	Laterality	CS	1	2C
(0008,1050)	Performing Physician's Name	PN	1	3
(0018,1030)	Protocol Name	LO	1	3
(0008,1070)	Operators' Name	PN	1	3
(0018,0015)	Body Part Examined	CS	1	3
(0040,0275)	Request Attributes Sequence	SQ	1	3
>(0040,1001)	Requested Procedure ID	SH	1	1C
>(0040,0009)	Scheduled Procedure Step ID	SH	1	1C
>(0040,0007)	Scheduled Procedure Step Description	LO	1	3
>(0040,0008)	Scheduled Protocol Code Sequence	SQ	1	3
>>(0008,0100)	Code Value	SH	1	1C
>>(0008,0102)	Coding Scheme Designator	SH	1	1C
>>(0008,0104)	Code Meaning	LO	1	1C
(0040,0253)	Performed Procedure Step ID	SH	1	3
(0040,0244)	Performed Procedure Step Start Date	DA	1	3
(0040,0245)	Performed Procedure Step Start Time	TM	1	3
(0040,0254)	Performed Procedure Step Description	LO	1	3
(0040,0260)	Performed Protocol Code Sequence	SQ	1	3
>(0008,0100)	Code Value	SH	1	1C
>(0008,0102)	Coding Scheme Designator	SH	1	1C
>(0008,0104)	Code Meaning	LO	1	1C

DX Series				
Tag	Attribute Name	VR	VM	Type
(0008,0060)	Modality	CS	1	1
(0008,0068)	Presentation Intent Type	CS	1	1

Mammography Series				
Tag	Attribute Name	VR	VM	Type
(0008,0060)	Modality	CS	1	1

General Device				
Tag	Attribute Name	VR	VM	Type
(0008,0070)	Manufacturer	LO	1	2
(0008,0080)	Institution Name	LO	1	3
(0008,0081)	Institution Address	ST	1	3
(0008,1010)	Station Name	SH	1	3
(0008,1040)	Institutional Department Name	LO	1	3
(0008,1090)	Manufacturer's Model Name	LO	1	3
(0018,1000)	Device Serial Number	LO	1	3
(0018,1020)	Software Version(s)	LO	4	3
(0018,1200)	Date of Last Calibration	DA	1	3
(0018,1201)	Time of Last Calibration	TM	1	3

General Image				
Tag	Attribute Name	VR	VM	Type
(0020,0013)	Instance Number	IS	1	2
(0020,0020)	Patient Orientation	CS	2	2C
(0008,0023)	Content Date	DA	1	2C
(0008,0033)	Content Time	TM	1	2C
(0008,0008)	Image Type	CS	2	3
(0020,0012)	Acquisition Number	IS	1	3
(0008,2112)	Source Image Sequence	SQ	1	3
>(0008,1150)	Referenced SOP Class UID	UI	1	1C
>(0008,1155)	Referenced SOP Instance UID	UI	1	1C
(0020,4000)	Image Comments	LT	1	3
(0028,0300)	Quality Control Image	CS	1	3
(0028,0301)	Burned In Annotation	CS	1	3
(0028,2110)	Lossy Image Compression	CS	1	3

Image Pixel				
Tag	Attribute Name	VR	VM	Type
(0028,0002)	Samples per Pixel	US	1	1
(0028,0004)	Photometric Interpretation	CS	1	1
(0028,0010)	Rows	US	1	1
(0028,0011)	Columns	US	1	1
(0028,0030)	Pixel Spacing	DS	2	3
(0028,0100)	Bits Allocated	US	1	1
(0028,0101)	Bits Stored	US	1	1
(0028,0102)	High Bit	US	1	1
(0028,0103)	Pixel Representation	US	1	1
(7FE0,0010)	Pixel Data	OW	1	1

[Important] When the tag “Imager Pixel Spacing (0018,1164)” or “Pixel Spacing (0028,0030)” is used on the other connecting device for the purpose of measurement, make sure to confirm the consistency in advance. Specifically when reducing the size of the image, pay attention that the measured value might be corrected according to the reduction ratio.

Contrast/Bolus				
Tag	Attribute Name	VR	VM	Type
(0018,0010)	Contrast/Bolus Agent	LO	1	2
(0018,1040)	Contrast/Bolus Route	LO	1	3
(0018,1041)	Contrast/Bolus Volume	DS	1	3
(0018,1042)	Contrast/Bolus Start Time	TM	1	3
(0018,1043)	Contrast/Bolus Stop Time	TM	1	3
(0018,1044)	Contrast/Bolus Total Dose	DS	1	3
(0018,1046)	Contrast Flow Rate(s)	DS	1	3
(0018,1047)	Contrast Flow Duration(s)	DS	1	3
(0018,1048)	Contrast/Bolus Ingredient	CS	1	3
(0018,1049)	Contrast/Bolus Ingredient Concentration	DS	1	3

Display Shutter				
Tag	Attribute Name	VR	VM	Type
(0018,1600)	Shutter Shape	CS	1-3	3
(0018,1602)	Shutter Left Vertical Edge	IS	1	1C
(0018,1604)	Shutter Right Vertical Edge	IS	1	1C
(0018,1606)	Shutter Upper Horizontal Edge	IS	1	1C
(0018,1608)	Shutter Lower Horizontal Edge	IS	1	1C
(0018,1610)	Center of Circular Shutter	IS	2	1C
(0018,1612)	Radius of Circular Shutter	IS	1	1C
(0018,1620)	Vertices of the Polygonal Shutter	IS	2-2n	1C

DX Anatomy Imaged				
Tag	Attribute Name	VR	VM	Type
(0020,0062)	Image Laterality	CS	1	1
(0008,2218)	Anatomic Region Sequence	SQ	1	2
>(0008,0100)	Code Value	SH	1	1C
>(0008,0102)	Coding Scheme Designator	SH	1	1C
>(0008,0104)	Code Meaning	LO	1	1C

DX Image				
Tag	Attribute Name	VR	VM	Type
(0008,0008)	Image Type	CS	1-n	1
(0028,0002)	Samples per Pixel	US	1	1
(0028,0004)	Photometric Interpretation	CS	1	1
(0028,0100)	Bits Allocated	US	1	1
(0028,0101)	Bits Stored	US	1	1
(0028,0102)	High Bit	US	1	1
(0028,0103)	Pixel Representation	US	1	1
(0028,1040)	Pixel Intensity Relationship	CS	1	1
(0028,1041)	Pixel Intensity Relationship Sign	SS	1	1
(0028,1052)	Rescale Intercept	DS	1	1
(0028,1053)	Rescale Slope	DS	1	1
(0028,1054)	Rescale Type	LO	1	1
(2050,0020)	Presentation LUT Shape	CS	1	1
(0028,2110)	Lossy Image Compression	CS	1	3
(0020,0020)	Patient Orientation	CS	2	2C
(0028,0301)	Burned In Annotation	CS	1	1
(0028,3010)	VOI LUT Sequence	SQ	1	1C
>(0028,3002)	LUT Descriptor	US	3	1C
>(0028,3006)	LUT Data	US	4096	1C
(0028,1050)	Window Center	DS	1	1C
(0028,1051)	Window Width	DS	1	1C

DX Detector				
Tag	Attribute Name	VR	VM	Type
(0018,7004)	Detector Type	CS	1	2
(0018,7005)	Detector Configuration	CS	1	3
(0018,700A)	Detector ID	SH	1	3
(0018,700C)	Date of Last Detector Calibration	DA	1	3
(0018,700E)	Time of Last Detector Calibration	TM	1	3
(0018,7010)	Exposures on Detector Since Last Calibration	IS	1	3
(0018,7011)	Exposures on Detector Since Manufactured	IS	1	3
(0018,7012)	Detector Time Since Last Exposure	DS	1	3
(0018,7016)	Detector Activation Offset From Exposure	DS	1	3
(0018,6000)	Sensitivity	DS	1	3
(0018,1147)	Field of View Shape	CS	1	3
(0018,1149)	Field of View Dimension(s)	IS	1-2	3
(0018,7030)	Field of View Origin	DS	2	1C
(0018,7032)	Field of View Rotation	DS	1	1C
(0018,7034)	Field of View Horizontal Flip	CS	1	1C
(0018,1164)	Imager Pixel Spacing	DS	2	1
(0018,7024)	Detector Active Shape	CS	1	3
(0018,7026)	Detector Active Dimension(s)	DS	1-2	3
(0018,7028)	Detector Active Origin	DS	2	3

[Important] When the tag “Imager Pixel Spacing (0018,1164)” or “Pixel Spacing (0028,0030)” is used on the other connecting device for the purpose of measurement, make sure to confirm the consistency in advance. Specifically when reducing the size of the image, pay attention that the measured value might be corrected according to the reduction ratio.

X-Ray Collimator				
Tag	Attribute Name	VR	VM	Type
(0018,1700)	Collimator Shape	CS	1	1
(0018,1702)	Collimator Left Vertical Edge	IS	1	1C
(0018,1704)	Collimator Right Vertical Edge	IS	1	1C
(0018,1706)	Collimator Upper Horizontal Edge	IS	1	1C
(0018,1708)	Collimator Lower Horizontal Edge	IS	1	1C

DX Positioning				
Tag	Attribute Name	VR	VM	Type
(0018,5101)	View Position	CS	1	2
(0018,1111)	Distance Source to Patient	DS	1	3
(0018,1110)	Distance Source to Detector	DS	1	3

X-Ray Acquisition Dose				
Tag	Attribute Name	VR	VM	Type
(0018,0060)	KVP	DS	1	3
(0018,1151)	X-ray Tube Current	IS	1	3
(0018,1150)	Exposure Time	IS	1	3
(0018,1152)	Exposure	IS	1	3
(0018,1153)	Exposure in µAs	IS	1	3
(0018,1110)	Distance Source to Detector	DS	1	3
(0018,1111)	Distance Source to Patient	DS	1	3
(0018,115E)	Image and Fluoroscopy Area Dose Product	DS	1	3
(0040,0302)	Entrance Dose	US	1	3
(0040,0303)	Exposed Area	US	1-2	3
(0040,0306)	Distance Source to Entrance	DS	1	3
(0018,1191)	Anode Target Material	CS	1	3
(0018,7050)	Filter Material	CS	1-n	3
(0018,7052)	Filter Thickness Minimum	DS	1-n	3
(0018,7054)	Filter Thickness Maximum	DS	1-n	3
(0018,1156)	Rectification Type	CS	1	3

X-Ray Generation				
Tag	Attribute Name	VR	VM	Type
(0018,0060)	KVP	DS	1	3
(0018,1151)	X-ray Tube Current	IS	1	3
(0018,1150)	Exposure Tim	IS	1	3
(0018,1152)	Exposure	IS	1	3
(0018,1153)	Exposure in µAs	IS	1	3
(0018,7060)	Exposure Control Mode	CS	1	3
(0018,7062)	Exposure Control Mode Description	LT	1	3
(0018,7064)	Exposure Status	CS	1	3
(0018,7065)	Phototimer Setting	DS	1	3
(0018,1190)	Focal Spot(s)	DS	1-n	3
(0018,1191)	Anode Target Material	CS	1	3
(0018,1156)	Rectification Type	CS	1	3

X-Ray Filtration				
Tag	Attribute Name	VR	VM	Type
(0018,1160)	Filter Type	SH	1	3
(0018,7050)	Filter Material	CS	1-n	3
(0018,7052)	Filter Thickness Minimum	DS	1-n	3
(0018,7054)	Filter Thickness Maximum	DS	1-n	3

X-Ray Grid				
Tag	Attribute Name	VR	VM	Type
(0018,1166)	Grid	CS	1	3
(0018,7040)	Grid Absorbing Material	LT	1	3
(0018,7041)	Grid Spacing Material	LT	1	3
(0018,7042)	Grid Thickness	DS	1	3
(0018,7044)	Grid Pitch	DS	1	3
(0018,7046)	Grid Aspect Ratio	IS	2	3
(0018,704C)	Grid Focal Distance	DS	1	3

Mammography Image				
Tag	Attribute Name	VR	VM	Type
(0018,1508)	Positioner Type	CS	1	1
(0020,0062)	Image Laterality	CS	1	1
(0040,0318)	Organ Exposed	CS	1	1
(0008,2218)	Anatomic Region Sequence	SQ	1	1
>(0008,0100)	Code Value	SH	1	1C
>(0008,0102)	Coding Scheme Designator	SH	1	1C
>(0008,0104)	Code Meaning	LO	1	1C
(0054,0220)	View Code Sequence	SQ	1	1
>(0008,0100)	Code Value	SH	1	1C
>(0008,0102)	Coding Scheme Designator	SH	1	1C
>(0008,0104)	Code Meaning	LO	1	1C
(0054,0222)	View Modifier Code Sequence	SQ	1	2
>(0008,0100)	Code Value	SH	1	1C
>(0008,0102)	Coding Scheme Designator	SH	1	1C
>(0008,0104)	Code Meaning	LO	1	1C

VOI LUT				
Tag	Attribute Name	VR	VM	Type
(0028,3010)	VOI LUT Sequence	SQ	1	3
>(0028,3002)	LUT Descriptor	US	3	1C
>(0028,3006)	LUT Data	US	4095	1C
(0028,1050)	Window Center	DS	1	3
(0028,1051)	Window Width	DS	1	1C

Acquisition Context				
Tag	Attribute Name	VR	VM	Type
(0040,0555)	Acquisition Context Sequence	SQ	1	2

SOP Common				
Tag	Attribute Name	VR	VM	Type
(0008,0016)	SOP Class UID	UI	1	1
(0008,0018)	SOP Instance UID	UI	1	1
(0008,0005)	Specific Character Set	CS	2-3	1C

Private Data				
Tag	Attribute Name	VR	VM	Type
(0031,0010)	Private Creator	CS	1	3
(0031,10FF)	Private Data Sequence	SQ	1	1C
	Private Data			

3.2.2.6 X-Ray Radiation Dose SR SOP Class

This model conforms with the X-Ray Radiation Dose SR Class.
The CS-7 uses C-STORE to store SR documents on an image storage device (SCP).

Behavior: The CS-7 executes the C-STORE DIMSE service for SOP instances that match the X-Ray Radiation Dose SR IOD request. The CS-7 recognizes the C-STORE response status and takes appropriate action depending on whether the service terminated normally or not.

X-Ray Radiation Dose SR IOD Modules

IE	Module	Usage
Patient	Patient	M
Study	General Study	M
	Patient Study	U
Series	SR Document Series	M
Device	General Device	M
	Extended General Device	Implemented in general device modules
Documents	General SR Document	M
	SR Document Content	M
	SOP Common	M

Patient				
Tag	Attribute Name	VR	VM	Type
(0010,0010)	Patient's Name	PN	1	2
(0010,0020)	Patient ID	LO	1	2
(0010,0030)	Patient's Birth Date	DA	1	2
(0010,0040)	Patient's Sex	CS	1	2
(0010,0032)	Patient's Birth Time	TM	1	3
(0010,1000)	Other Patient IDs	LO	1	3
(0010,1001)	Other Patient Names	PN	1	3
(0010,2160)	Ethnic Group	SH	1	3
(0010,4000)	Patient Comments	LT	1	3

General Study				
Tag	Attribute Name	VR	VM	Type
(0020,000D)	Study Instance UID	UI	1	1
(0008,0020)	Study Date	DA	1	2
(0008,0030)	Study Time	TM	1	2
(0008,0090)	Referring Physician Name	PN	1	2
(0020,0010)	Study ID	SH	1	2
(0008,0050)	Accession Number	SH	1	2
(0008,1030)	Study Description	LO	1	3
(0008,1048)	Physician(s) of Record	PN	1	3
(0008,1060)	Name of Physician(s) Reading Study	PN	1	3

Patient Study				
Tag	Attribute Name	VR	VM	Type
(0008,1080)	Admission Diagnosis Description	LO	1	3
(0010,1010)	Patient's Age	AS	1	3
(0010,1020)	Patient's Size	DS	1	3
(0010,1030)	Patient's Weight	DS	1	3
(0010,2180)	Occupation	SH	1	3
(0010,21B0)	Additional Patient History	LT	1	3
(0038,0010)	Admission ID	LO	1	3
(0010,2203)	Patient's Sex Neutered	CS	1	2C

SR Document Series				
Tag	Attribute Name	VR	VM	Type
(0008,0060)	Modality	CS	1	1
(0020,000E)	Series Instance UID	UI	1	1
(0020,0011)	Series Number	IS	1	1
(0008,1111)	Referenced Performed Procedure Step Sequence	SQ	1	2

General Device				
Tag	Attribute Name	VR	VM	Type
(0008,0070)	Manufacturer	LO	1	1
(0008,0080)	Institution Name	LO	1	3
(0008,0081)	Institution Address	ST	1	3
(0008,1010)	Station Name	SH	1	3
(0008,1040)	Institutional Department Name	LO	1	3
(0008,1090)	Manufacturer's Model Name	LO	1	1
(0018,1000)	Device Serial Number	LO	1	1
(0018,1020)	Software Version(s)	LO	4	1

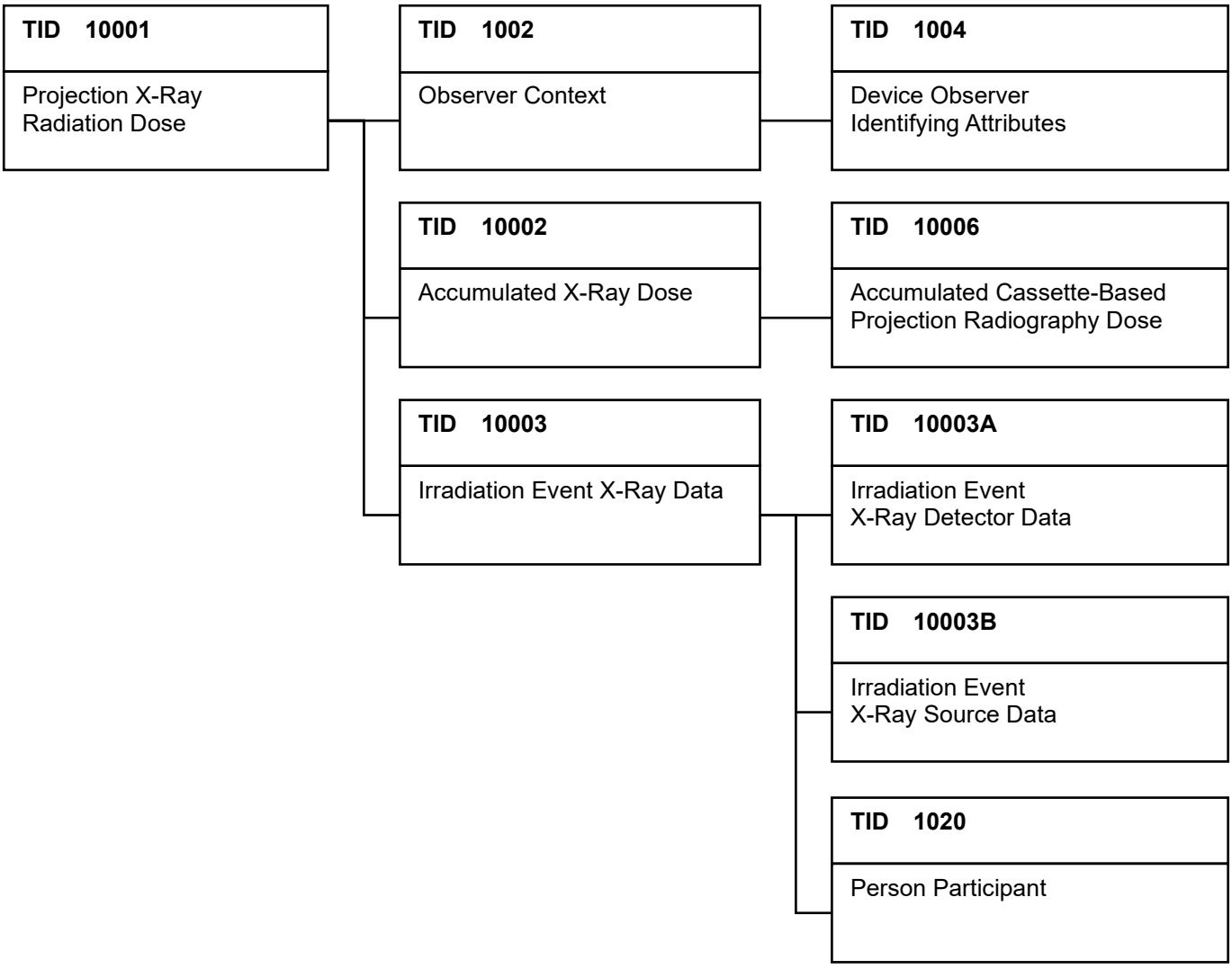
Some types have changed due to the implementation of extended general device modules.

General SR Document				
Tag	Attribute Name	VR	VM	Type
(0020,0013)	Instance Number	IS	1	1
(0040,A491)	Completion Flag	CS	1	1
(0040,A493)	Verification Flag	CS	1	1
(0008,0023)	Content Date	DA	1	1
(0008,0033)	Content Time	TM	1	1

SR Document Content
Refer to 3.2.2.7 X-Ray Radiation Dose SR Template Structure for more information on the SR document content output by the CS-7 via X-Ray Radiation Dose SR.

SOP Common				
Tag	Attribute Name	VR	VM	Type
(0008,0016)	SOP Class UID	UI	1	1
(0008,0018)	SOP Instance UID	UI	1	1
(0008,0005)	Specific Character Set	CS	2-3	1C
(0008,010F)	Context Identifier	CS	1	1
(0008,0105)	Mapping Resource	CS	1	1
(0008,0105)	Context Group Edition	DT	1	1

3.2.2.7 X-Ray Radiation Dose SR Template Structure



TID 10001 Projection X-Ray Radiation Dose					
NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV (113701, DCM, "X-Ray Radiation Dose Report")	1	ALWAYS	
>	HAS INCLUDE CONCEPT MOD	EV (121058, DCM, "Procedure reported")	1	ALWAYS	
>>	HAS INCLUDE CONCEPT MOD	EV (G-C0E8, SRT, "Has Intent")	1	ALWAYS	DT (113704, DCM, "Projection X-Ray")
>	CONTAINS	EV (122142, DCM, "Acquisition Device Type")	1	ALWAYS	"Diagnostic Intent"
>		DTID 1002 "Observer Context"	1-n	ALWAYS	
>	HAS OBS CONTEXT	EV (113705, DCM, "Scope of Accumulation")	1	ALWAYS	DCID (10000) Scope of Accumulation "Study"
>>	HAS PROPERTIES	DCID 10001 "UID Types"	1	ALWAYS	
>	CONTAINS	EV (113945, DCM, "X-Ray Detector Data Available")	1	ALWAYS	DCID(230) Yes-No "YES"
>	CONTAINS	EV (113943, DCM, "X-Ray Source Data Available")	1	ALWAYS	DCID(230) Yes-No "YES"
>	CONTAINS	EV (113944, DCM, "X-Ray Mechanical Data Available")	1	ALWAYS	DCID(230) Yes-No "NO"
>	CONTAINS	DTID 10002 "Accumulated X-Ray Dose"	1	ALWAYS	
>	CONTAINS	DTID 10003 "Irradiation Event X-Ray Data"	1-n	ALWAYS	
>	CONTAINS	EV (113854, DCM, "Source of Dose Information")	1-n	ALWAYS	DCID (10020) Source of Projection X-Ray Dose Information "Automated Data Collection" "Manual Entry" "Computed From Image Attributes"

TID 1002 Observer Context					
NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
	HAS OBS CONTEXT	EV (121005, DCM, "Observer Type")	1	ALWAYS	DCID(270)Observer Type "Device"
	HAS OBS CONTEXT	DTID 1004 "Device Observer Identifying Attributes"	1	ALWAYS	

TID 1004 Device Observer Identifying Attributes					
NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV (121012, DCM, "Device Observer UID")	1	ALWAYS	

TID 10002 Accumulated X-Ray Dose					
NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV (113702, DCM, "Accumulated X-Ray Dose Data")	1	ALWAYS	
>	HAS CONCEPT MOD	EV (113764, DCM, "Acquisition Plane")	1	ALWAYS	"Single Plane"
>	CONTAINS	DTID 10006 "Accumulated Cassette-based Projection Radiography Dose"	1	ALWAYS	

TID 10006 Accumulated Cassette-based Projection Radiography Dose					
NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV (113947, DCM, "Detector Type")	1	ALWAYS	DCID(10030)Detector Types "Storage Detector"
		EV (113731, DCM, "Total Number of Radiographic Frames")	1	ALWAYS	

TID 10003. Irradiation Event X-Ray Data					
NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV (113706, DCM, "Irradiation Event X-Ray Data")	1	ALWAYS	
>	HAS CONCEPT MOD	EV (113764, DCM, "Acquisition Plane")	1	ALWAYS	DCID(10003)Equipment Plane Identification "Single Plane"
>	CONTAINS	EV (113769, DCM, "Irradiation Event UID")	1	ALWAYS	
>	CONTAINS	DT (111526, DCM, "DateTime Started")	1	ALWAYS	
>	CONTAINS	EV (113721, DCM, "Irradiation Event Type")	1	ALWAYS	DCID(10002)Irradiation Event Types "Stationary Acquisition"
>	CONTAINS	EV (125203, DCM, "Acquisition Protocol")	1	ALWAYS	
>	CONTAINS	EV (123014, DCM, "Target Region")	1	ALWAYS	DCID(4031)Common Anatomic Regions
>	CONTAINS	EV (122130, DCM, "Dose Area Product")	1	ALWAYS	UNITS = EV (Gy.m2, UCUM, "Gy.m2")
>	CONTAINS	EV (121106, DCM, "Comment")	1	ANAP	
>	CONTAINS	DTID 1020 “Person Participant”	1	ALWAYS	$PersonProcedureRole = EV (113850, DCM, "Irradiation Authorizing")
>	CONTAINS	DTID 10003A "Irradiation Event X-Ray Detector Data"	1	ALWAYS	
>	CONTAINS	DTID 10003B "Irradiation Event X-Ray Source Data"	1	ALWAYS	

TID 10003A. Irradiation Event X-Ray Detector Data					
NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV (113845, DCM, "Exposure Index")	1	ALWAYS	UNITS = EV (1, UCUM, "no units")
		EV (113846, DCM, "Target Exposure Index")	1	ALWAYS	UNITS = EV (1, UCUM, "no units")
		EV (113847, DCM, "Deviation Index")	1	ALWAYS	UNITS = EV (1, UCUM, "no units")
		EV (113795, DCM, "Acquired Image")	1-n	ALWAYS	

TID 10003B. Irradiation Event X-Ray Source Data					
NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV (113738, DCM, "Dose (RP) ")	1	ALWAYS	UNITS = EV (Gy, UCUM, "Gy")
		EV (113780, DCM, "Reference Point Definition")	1	ALWAYS	
		EV (113768, DCM, "Number of Pulses")	1	ALWAYS	UNITS = EV (1, UCUM, "no units")
		EV (113733, DCM, "KVP")	1-n	ALWAYS	UNITS = EV (kV, UCUM, "kV")
		EV (113734, DCM, "X-Ray Tube Current")	1-n	ALWAYS	UNITS = EV (mA, UCUM, "mA")
		EV (113824, DCM, "Exposure Time")	1	ALWAYS	UNITS = EV (ms, UCUM, "ms")

TID 1020 Person Participant					
NL	Rel with Parent	Concept Name	VM	Presence of Value	Value
		EV (113870, DCM, "Person Name")	1	ALWAYS	
>	HAS PROPERTIES	EV (113875, DCM, "Person Role in Procedure")	1	ALWAYS	$PersonProcedureRole
>	HAS PROPERTIES	EV (113873, DCM, "Organization Name")	1	ALWAYS	
>	HAS PROPERTIES	EV (113874, DCM, "Person Role in Organization")	1	ALWAYS	

3.2.2.8 X-Ray Radiofluoroscopic Image Storage SOP Class

This model conforms with the X-Ray Radiofluoroscopic Image SOP Class for Presentation SOP Class.
The CS-7 uses C-STORE to store image data on an image storage device (SCP).
If necessary, Private Data are output.

Behavior: For SOP instances matching the X-Ray Radiofluoroscopic Image IOD request, the CS-7 executes the C-STORE DIMSE service.
The CS-7 recognizes the C-STORE response status and takes appropriate action depending on whether the service terminated normally or not.

X-Ray Radiofluoroscopic Image IOD Modules

IE	Module	Usage
Patient	Patient	M
Study	General Study	M
	Patient Study	U
Series	General Series	M
Equipment	General Equipment	M
Image	General Image	M
	Image Pixel	M
	Contrast/Bolus	Required if contrast media was used in this Image
	Cine	Required if pixel data is Multi-frame Cine Data
	Multi-frame	Required if pixel data is Multi-frame Cine Data
	X-Ray Image	M
	X-Ray Acquisition	M
	X-Ray Collimator	U
	DX Detector	U
	Modality LUT	C - Required if Pixel Intensity Relationship (0028,1040) is LOG U - Optional if Pixel Intensity Relationship (0028,1040) is DISP
	VOI LUT	U
	SOP Common	M

Patient				
Tag	Attribute Name	VR	VM	Type
(0010,0010)	Patient's Name	PN	1	2
(0010,0020)	Patient ID	LO	1	2
(0010,0030)	Patient's Birth Date	DA	1	2
(0010,0040)	Patient's Sex	CS	1	2
(0010,0032)	Patient's Birth Time	TM	1	3
(0010,1000)	Other Patient IDs	LO	1	3
(0010,1001)	Other Patient Names	PN	1	3
(0010,2160)	Ethnic Group	SH	1	3
(0010,4000)	Patient Comments	LT	1	3

General Study				
Tag	Attribute Name	VR	VM	Type
(0020,000D)	Study Instance UID	UI	1	1
(0008,0020)	Study Date	DA	1	2
(0008,0030)	Study Time	TM	1	2
(0008,0090)	Referring Physician's Name	PN	1	2
(0020,0010)	Study ID	SH	1	2
(0008,0050)	Accession Number	SH	1	2
(0008,1030)	Study Description	LO	1	3
(0008,1048)	Physician(s) of Record	PN	1	3
(0008,1060)	Name of Physician(s) Reading Study	PN	1	3
(0032,1033)	Requesting Department	LO	1	3

Patient Study				
Tag	Attribute Name	VR	VM	Type
(0008,1080)	Admitting Diagnoses Description	LO	1	3
(0008,1084)	Admitting Diagnoses Code Sequence	SQ	1	3
(0010,1010)	Patient's Age	AS	1	3
(0010,1020)	Patient's Size	DS	1	3
(0010,1030)	Patient's Weight	DS	1	3
(0010,2180)	Occupation	SH	1	3
(0010,21B0)	Additional Patient History	LT	1	3
(0038,0010)	Admission ID	LO	1	3
(0038,0014)	Issuer of Admission ID Sequence	SQ	1	3
(0038,0060)	Service Episode ID	LO	1	3
(0038,0064)	Issuer of Service Episode ID Sequence	SQ	1	3
(0038,0062)	Service Episode Description	LO	1	3
(0010,2203)	Patient's Sex Neutered	CS	1	2C

General Series				
Tag	Attribute Name	VR	VM	Type
(0008,0060)	Modality	CS	1	1
(0008,103E)	Series Description	LO	1	3
(0020,000E)	Series Instance UID	UI	1	1
(0020,0011)	Series Number	IS	1	2
(0020,0060)	Laterality	CS	1	2C
(0008,0021)	Series Date	DA	1	3
(0008,0031)	Series Time	TM	1	3
(0008,1050)	Performing Physician's Name	PN	1	3
(0018,1030)	Protocol Name	LO	1	3
(0008,1070)	Operator's Name	PN	1	3
(0008,1111)	Referenced Performed Procedure Step Sequence	SQ	1	3
> (0008,1150)	Referenced SOP Class UID	UI	1	1
> (0008,1155)	Referenced SOP Instance UID	UI	1	1
(0018,0015)	Body Part Examined	CS	1	3
(0018,5100)	Patient Position	CS	1	2C
(0028,0108)	Smallest Pixel Value in Series	US	1	3
(0028,0109)	Largest Pixel Value in Series	US	1	3
(0040,0275)	Request Attributes Sequence	SQ	1	3
>(0040,1001)	Requested Procedure ID	SH	1	1C
>(0040,0009)	Scheduled Procedure Step ID	SH	1	1C

>(0040,0007)	Scheduled Procedure Step Description	LO	1	3
>(0040,0008)	Scheduled Protocol Code Sequence	SQ	1	3
(0040,0253)	Performed Procedure Step ID	SH	1	3
(0040,0244)	Performed Procedure Step Start Date	DA	1	3
(0040,0245)	Performed Procedure Step Start Time	TM	1	3
(0040,0254)	Performed Procedure Step Description	LO	1	3
(0040,0260)	Performed Protocol Code Sequence	SQ	1	3
>(0008,0100)	Code Value	SH	1	1C
>(0008,0102)	Coding Scheme Designator	SH	1	1C
>(0008,0103)	Coding Scheme Version	SH	1	1C
>(0008,0104)	Code Meaning	LO	1	1C
(0040,0280)	Comments on the Performed Procedure Step	ST	1	3
(0010,2210)	Anatomical Orientation Type	CS	1	1C

General Device				
Tag	Attribute Name	VR	VM	Type
(0008,0070)	Manufacturer	LO	1	2
(0008,0080)	Institution Name	LO	1	3
(0008,0081)	Institution Address	ST	1	3
(0018,1008)	Gantry ID	LO	1	3
(0008,1010)	Station Name	SH	1	3
(0008,1040)	Institutional Department Name	LO	1	3
(0008,1090)	Manufacturer's Model Name	LO	1	3
(0018,1000)	Device Serial Number	LO	1	3
(0018,1020)	Software Version(s)	LO	4	3
(0018,1200)	Date of Last Calibration	DA	1	3
(0018,1201)	Time of Last Calibration	TM	1	3
(0028,0120)	Pixel Padding Value	US	1	1C

General Image				
Tag	Tag	Tag	Tag	Tag
(0020,0013)	Instance Number	IS	1	2
(0020,0020)	Patient Orientation	CS	2	2C
(0008,0023)	Content Date	DA	1	2C
(0008,0033)	Content Time	TM	1	2C
(0008,0008)	Image Type	CS	2	3
(0020,0012)	Acquisition Number	IS	1	3
(0008,0022)	Acquisition Date	DA	1	3
(0008,0032)	Acquisition Time	TM	1	3
(0008,2112)	Source Image Sequence	SQ	1	3
>(0008,1150)	Referenced SOP Class UID	UI	1	1C
>(0008,1155)	Referenced SOP Instance UID	UI	1	1C
(0020,4000)	Image Comments	LT	1	3
(0028,0300)	Quality Control Image	CS	1	3
(0028,0301)	Burned In Annotation	CS	1	3
(0028,2110)	Lossy Image Compression	CS	1	3

Image Pixel				
Tag	Tag	Tag	Tag	Tag
(0028,0002)	Samples per Pixel	US	1	1
(0028,0004)	Photometric Interpretation	CS	1	1
(0028,0010)	Rows	US	1	1
(0028,0011)	Columns	US	1	1
(0028,0030)	Pixel Spacing	DS	2	3
(0028,0100)	Bits Allocated	US	1	1
(0028,0101)	Bits Stored	US	1	1
(0028,0102)	High Bit	US	1	1
(0028,0103)	Pixel Representation	US	1	1
(0028,0106)	Smallest Image Pixel Value	US	1	3
(0028,0107)	Largest Image Pixel Value	US	1	3
(0028,1101)	Red Palette Color Lookup Table Descriptor	US	3	1C
(0028,1102)	Green Palette Color Lookup Table Descriptor	US	3	1C
(0028,1103)	Blue Palette Color Lookup Table Descriptor	US	3	1C
(7FE0,0010)	Pixel Data	OW	1	1

[Important] When the tag “Imager Pixel Spacing (0018,1164)” or “Pixel Spacing (0028,0030)” is used on the other connecting device for the purpose of measurement, make sure to confirm the consistency in advance.
Specifically when reducing the size of the image, pay attention that the measured value might be corrected according to the reduction ratio.

Contrast/Bolus				
Tag	Attribute Name	VR	VM	Type
(0018,0010)	Contrast/Bolus Agent	LO	1	2
(0018,1040)	Contrast/Bolus Route	LO	1	3
(0018,1041)	Contrast/Bolus Volume	DS	1	3
(0018,1042)	Contrast/Bolus Start Time	TM	1	3
(0018,1043)	Contrast/Bolus Stop Time	TM	1	3
(0018,1044)	Contrast/Bolus Total Dose	DS	1	3
(0018,1046)	Contrast Flow Rate(s)	DS	1	3
(0018,1047)	Contrast Flow Duration(s)	DS	1	3
(0018,1048)	Contrast/Bolus Ingredient	CS	1	3
(0018,1049)	Contrast/Bolus Ingredient Concentration	DS	1	3

Cine				
Tag	Attribute Name	VR	VM	Type
(0018,1063)	Frame Time	DS	1	1C

Multi-frame				
Tag	Attribute Name	VR	VM	Type
(0028,0008)	Number of Frames	IS	1	1
(0028,0009)	Frame Increment Pointer	AT	1-n	1

X-Ray Image				
Tag	Attribute Name	VR	VM	Type
(0028,0009)	Frame Increment Pointer	AT	1-n	1C
(0028,2110)	Lossy Image Compression	CS	1	1C
(0008,0008)	Image Type	CS	2-n	1
(0028,1040)	Pixel Intensity Relationship	CS	1	1
(0028,0002)	Samples per Pixel	US	1	1
(0028,0004)	Photometric Interpretation	CS	1	1
(0028,0100)	Bits Allocated	US	1	1
(0028,0101)	Bits Stored	US	1	1
(0028,0102)	High Bit	US	1	1
(0028,0103)	Pixel Representation	US	1	1

X-Ray Acquisition				
Tag	Attribute Name	VR	VM	Type
(0018,0060)	KVP	DS	1	2
(0018,1155)	Radiation Setting	CS	1	1
(0018,1151)	X-Ray Tube Current	IS	1	2C
(0018,8151)	X-Ray Tube Current in uA	DS	1	3
(0018,1150)	Exposure Time	IS	1	2C
(0018,8150)	Exposure Time in uS	DS	1	3
(0018,1152)	Exposure	IS	1	2C
(0018,1153)	Exposure in μAs	IS	1	3
(0018,1166)	Grid	CS	1-n	3
(0018,1154)	Average Pulse Width	DS	1	3

X-Ray Collimator				
Tag	Attribute Name	VR	VM	Type
(0018,1700)	Collimator Shape	CS	1-3	1
(0018,1702)	Collimator Left Vertical Edge	IS	1	1C
(0018,1704)	Collimator Right Vertical Edge	IS	1	1C
(0018,1706)	Collimator Upper Horizontal Edge	IS	1	1C
(0018,1708)	Collimator Lower Horizontal Edge	IS	1	1C
(0018,1710)	Center of Circular Collimator	IS	2	1C
(0018,1712)	Radius of Circular Collimator	IS	1	1C
(0018,1720)	Vertices of the Polygonal Collimator	IS	2-2n	1C

DX Detector				
Tag	Attribute Name	VR	VM	Type
(0018,7004)	Detector Type	CS	1	2
(0018,7005)	Detector Configuration	CS	1	3
(0018,7006)	Detector Description	LT	1	3
(0018,7008)	Detector Mode	LT	1	3
(0018,700A)	Detector ID	SH	1	3
(0018,700C)	Date of Last Detector Calibration	DA	1	3
(0018,700E)	Time of Last Detector Calibration	TM	1	3
(0018,7010)	Exposures on Detector Since Last Calibration	IS	1	3

(0018,7011)	Exposures on Detector Since Manufactured	IS	1	3
(0018,7012)	Detector Time Since Last Exposure	DS	1	3
(0018,7014)	Detector Active Time	DS	1	3
(0018,7016)	Detector Activation Offset From Exposure	DS	1	3
(0018,701A)	Detector Binning	DS	2	3
(0018,7000)	Detector Conditions Nominal Flag	CS	1	3
(0018,7001)	Detector Temperature	DS	1	3
(0018,6000)	Sensitivity	DS	1	3
(0018,1147)	Field of View Shape	CS	1	3
(0018,1149)	Field of View Dimension(s)	IS	1-2	3
(0018,7030)	Field of View Origin	DS	2	1C
(0018,7032)	Field of View Rotation	DS	1	1C
(0018,7034)	Field of View Horizontal Flip	CS	1	1C
(0018,1164)	Imager Pixel Spacing	DS	2	1
(0018,7020)	Detector Element Physical Size	DS	2	3
(0018,7022)	Detector Element Spacing	DS	2	3
(0018,7024)	Detector Active Shape	CS	1	3
(0018,7026)	Detector Active Dimension(s)	DS	1-2	3
(0018,7028)	Detector Active Origin	DS	2	3
(0018,1411)	Exposure Index	DS	1	3
(0018,1412)	Target Exposure Index	DS	1	3
(0018,1413)	Deviation Index	DS	1	3

[Important] When the tag “Imager Pixel Spacing (0018,1164)” or “Pixel Spacing (0028,0030)” is used on the other connecting device for the purpose of measurement, make sure to confirm the consistency in advance.
Specifically when reducing the size of the image, pay attention that the measured value might be corrected according to the reduction ratio.

Modality LUT				
Tag	Attribute Name	VR	VM	Type
(0028,1052)	Rescale Intercept	DS	1	1C
(0028,1053)	Rescale Slope	DS	1	1C
(0028,1054)	Rescale Type	LO	1	1C

VOI LUT				
Tag	Tag	Tag	Tag	Tag
(0028,3010)	VOI LUT Sequence	SQ	1	3
>(0028,3002)	LUT Descriptor	US	3	1C
>(0028,3003)	LUT Explanation	LO	1	3
>(0028,3006)	LUT Data	US	4095	1C
(0028,1050)	Window Center	DS	1	3
(0028,1051)	Window Width	DS	1	1C

SOP Common				
Tag	Tag	Tag	Tag	Tag
(0008,0016)	SOP Class UID	UI	1	1
(0008,0018)	SOP Instance UID	UI	1	1
(0008,0005)	Specific Character Set	CS	2-3	1C

Private Data				
Tag	Attribute Name	VR	VM	Type
(0031,0010)	Private Creator	CS	1	3
(0031,10FF)	Private Data Sequence	SQ	1	1C
	Private Data			

3.3 Basic Worklist Management Service Class SCU Specifications

The CS-7 supports the following SOP classes as Basic Worklist Management Service Class SCU.

SOP Class Name	SOP Class UID
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31

3.3.1 Association Establishment Policies

3.3.1.1 General

The CS-7 Basic Worklist Management Service Class SCU recognizes and uses the following Application context name.

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

The initial and maximum PDU size is 64 KB.

3.3.1.2 Number of Associations

The CS-7 Basic Worklist Management Service Class SCU issues a single association request at one time for the external AE that is implemented as a separate device.

3.3.1.3 Asynchronous Nature

Asynchronous processing is not supported.

3.3.1.4 Implementation Identifying Information

Description	Value
Implementation Class UID	1.2.392.200036.9107.307
Implementation Version Name	KM_CS7_1.00

3.3.2 Real World Activities

3.3.2.1 Associated Real World Activity

The relevant activity of the CS-7 Basic Worklist Management in the real world where an association has been established is issuing a C-FIND request to the Remote Basic Worklist Management Service Class SCP, to retrieve patient and study information.

3.3.2.2 Presentation Context Tables

The CS-7 Basic Worklist Management Service Class SCU performs requests with the following Presentation Contexts.

Abstract syntax			
Name	UID	Role	Extended Negotiation
Modality Worklist Information Model- FIND	1.2.840.10008.5.1.4.31	SCU	None

Transfer syntax	
Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2

3.3.2.3 Modality Worklist Information Model- FIND

This model conforms with the Modality Worklist Information Model- FIND.
The CS-7 uses C-FIND to query and retrieve the study information from the Basic Worklist Management Service Class SCP.

Behavior: The CS-7 executes the DIMSE services for SOP instances matching request attributes of the Modality Worklist Information Model- FIND.
The CS-7 recognizes the C-FIND response status and takes appropriate action depending on whether the service terminated normally or not.

DIMSE service request	Usage SCU/SCP
C-FIND	M/M

3.3.2.3.1 Matching Key Attributes

The CS-7 supports the following two search methods.

[Patient based search]

Tag	Attribute Name	VR	VM	Matching Key Type
SOP Common				
(0008,0005)	Specific Character Set	CS	1-n	O
Scheduled Procedure Step				
(0040,0100)	Scheduled Procedure Step Sequence	AE	1	R
>(0040,0001)	Scheduled Station AE Title	AE	1-n	R
>(0040,0002)	Scheduled Procedure Step Start Date	DA	1	R
>(0008,0060)	Modality	CS	1	R
>(0040,0010)	Scheduled Station Name	SH	1-n	O
Requested Procedure				
(0040,1001)	Requested Procedure ID	SH	1	O
Imaging Service Request				
(0008,0050)	Accession Number	SH	1	O
(0032,1033)	Requesting Department	LO	1	O
(0040,2016)	Placer Order Number/Imaging Service Request	LO	1	O
(0040,2017)	Filler Order Number/Imaging Service Request	LO	1	O
Patient Identification				
(0010,0010)	Patient's Name	PN	1	R
(0010,0020)	Patient ID	LO	1	R

[Wide range search]

Tag	Attribute Name	VR	VM	Matching Key Type
SOP Common				
(0008,0005)	Specific Character Set	CS	1-n	O
Scheduled Procedure Step				
(0040,0100)	Scheduled Procedure Step Sequence	SQ	1	R
>(0040,0001)	Scheduled Station AE Title	AE	1-n	R
>(0040,0002)	Scheduled Procedure Step Start Date	DA	1	R
>(0008,0060)	Modality	CS	1	R
>(0040,0010)	Scheduled Station Name	SH	1-n	R
>(0040,0011)	Scheduled Procedure Step Location	SH	1	R

3.3.2.3.2 Return Key Attributes

Tag	Attribute Name	VR	VM	Matching Key Type
SOP Common				
(0008,0005)	Specific Character Set	CS	1-n	O
Scheduled Procedure Step				
(0040,0100)	Scheduled Procedure Step Sequence	SQ	1	R
>(0040,0001)	Scheduled Station AE Title	AE	1-n	R
>(0040,0002)	Scheduled Procedure Step Start Date	DA	1	R
>(0040,0003)	Scheduled Procedure Step Start Time	TM	1	R
>(0008,0060)	Modality	CS	1	R
>(0040,0006)	Scheduled Performing Physician's Name	PN	1	R
>(0040,0007)	Scheduled Procedure Step Description	LO	1	O
>(0040,0010)	Scheduled Station Name	SH	1-n	O
>(0040,0011)	Scheduled Procedure Step Location	SH	1	O
>(0040,0012)	Pre-Medication	LO	1	O
>(0040,0008)	Scheduled Protocol Code Sequence	SQ	1	O
>>(0008,0100)	Code Value	SH	1	O
>>(0008,0102)	Coding Scheme Designator	SH	1	O
>>(0008,0104)	Code Meaning	LO	1	O
>(0040,0009)	Scheduled Procedure Step ID	SH	1	O
>(0032,1070)	Requested Contrast Agent	LO	1	O
>	All other attributes from the Scheduled Procedure Step Module			O
Requested Procedure				
(0040,1001)	Requested Procedure ID	SH	1	O
(0032,1060)	Requested Procedure Description	LO	1	O
(0032,1064)	Requested Procedure Code Sequence	SQ	1	O
>(0008,0100)	Code Value	SH	1	O
>(0008,0102)	Coding Scheme Designator	SH	1	O
>(0008,0104)	Code Meaning	LO	1	O
(0020,000D)	Study Instance UID	UI	1	O
(0020,0010)	Study ID	SH	1	O
(0008,0020)	Study Date	DA	1	O
(0008,0030)	Study Time	TM	1	O
(0040,1003)	Scheduled Procedure Priority	SH	1	O
(0008,1110)	Referenced Study Sequence	SQ	1	O
>(0008,1150)	Referenced SOP Class UID	UI	1	O
>(0008,1155)	Referenced SOP Instance UID	UI	1	O
(0040,1010)	Names of Intended Recipients of Results	PN	1	O
	All other attributes from the Requested Procedure Module			O

Imaging Service Request				
(0008,0050)	Accession Number	SH	1	O
(0032,1032)	Requesting Physician	PN	1	O
(0008,0090)	Referring Physician's Name	PN	1	O
	All other attributes from the Imaging Service Request Module			O

(0032,1033)	Requesting Department	SH	1	O
(0040,2016)	Placer Order Number/Imaging Service Request	LO	1	O
(0040,2017)	Filler Order Number/Imaging Service Request	LO	1	O
(0038,0010)	Admission ID	LO	1	O
Visit Identification				
(0038,0010)	Admission ID	LO	1	O
	All other attributes from the Visit Identification Module			O
Visit Status				
(0038,0300)	Current Patient Location	LO	1	O
(0038,0400)	Patient's Institution Residence	LO	1	O
	All other attributes from the Visit Status Module			O
Visit Relationship				
(0008,1120)	Referenced Patient Sequence	SQ	1	O
>(0008,1150)	Referenced SOP Class UID	UI	1	O
>(0008,1155)	Referenced SOP Instance UID	UI	1	O
	All other attributes from the Visit Relationship Module			O
Visit Admission				
(0008,0090)	Referring Physician's Name	PN	1	O
(0008,1080)	Admitting Diagnoses Description	LO	1-n	O
	All attributes from the Visit Admission Module			O
Patient Relationship				
	All attributes from the Patient Relationship Module			O
Patient Identification				
(0010,0010)	Patient's Name	PN	1	R
(0010,0020)	Patient ID	LO	1	R
(0010,1000)	Other Patient IDs	LO	1	O
(0010,1001)	Other Patient Names	PN	1-n	O
(0010,1005)	Patient’s Birth Name	PN	1	O
(0010,1060)	Patient Mother’s Birth Name	PN	1	O
(0010,1090)	Medical Record Locator	LO	1	O
	All other attributes from the Patient Identification Module			O
Patient Demographic				
(0010,0030)	Patient's Birth Date	DA	1	O
(0010,0040)	Patient's Sex	CS	1	O
(0010,1030)	Patient's Weight	DS	1	O
(0040,3001)	Confidentiality Constraint on Patient Data Description	LO	1	O
(0010,1010)	Patient's Age	AS	1	O
(0010,2180)	Occupation	SH	1	O
(0010,0032)	Patient's Birth Time	TM	1	O
(0010,1020)	Patient's Size	DS	1	O
(0010,2160)	Ethnic Group	SH	1	O
(0010,4000)	Patient Comments	LT	1	O
	All other attributes from the Patient Demographic Module			O

Patient Medical				
(0038,0500)	Patient State	LO	1	O
(0010,21C0)	Pregnancy Status	US	1	O
(0010,2000)	Medical Alerts	LO	1-n	O
(0010,2110)	Contrast Allergies	LO	1-n	O
(0038,0050)	Special Needs	LO	1	O

(0010,21A0)	Smoking Status	CS	1	O
(0010,21B0)	Additional Patient History	LT	1	O
(0010,21D0)	Last Menstrual Date	DA	1	O
(0010,2203)	Patient's Sex Neutered	CS	1	O
	All other attributes from the Patient Medical Module			O

*When obtaining exam tag information, one of the following values a) - c) will be required

a) (0040,0100) Scheduled Procedure Step Sequence
>(0040,0008) Scheduled Protocol Code Sequence
>>(0008,0100) Code Value
>>(0008,0102) Coding Scheme Designator

b) (0032,1064) Requested Procedure Code Sequence
>(0008,0100) Code Value
>(0008,0102) Coding Scheme Designator

c) (0032,1060) Requested Procedure Description
(0040,1001) Requested Procedure ID

* When using c, Requested Procedure Description (0032, 1060) and Requested Procedure ID (0040, 1001) are used as a substitute for Code Value (0008, 0100) and Coding Scheme Designator (0008, 0102).

3.4 Study Management Service Class SCU Specifications

The CS-7 supports the following SOP classes as Study Management Service Class SCU.

SOP Class Name	SOP Class UID
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3

3.4.1 Association Establishment Policies

3.4.1.1 General

The CS-7 Study Management Service Class SCU recognizes and uses the following application context name.

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

The initial and maximum PDU size is 64 KB.

3.4.1.2 Number of Associations

The CS-7 Study Management Service Class SCU issues a single association request at one time for the external AE that is implemented as a separate device.

3.4.1.3 Asynchronous Nature

Asynchronous processing is not supported.

3.4.1.4 Implementation Identifying Information

Description	Value
Implementation Class UID	1.2.392.200036.9107.307
Implementation Version Name	KM_CS7_1.00

3.4.2 Real World Activities

3.4.2.1 Associated Real World Activity

The relevant activity of the CS-7 Study Management Service Class SCU in the real world where an association has been established is sending N-CREATE/N-SET to the Remote Study Management Service Class SCP, to transmit study status information.

3.4.2.2 Presentation Context Tables

The CS-7 Study Management Service Class SCU performs requests with the following Presentation Contexts.

Abstract syntax			
Name	UID	Role	Extended Negotiation
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	SCU	None

Transfer syntax	
Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2

3.4.2.3 Modality Performed Procedure Step SOP Class

This model conforms with the Modality Performed Procedure Step SOP Class.
The CS-7 uses N-CREATE/N-SET to indicate the study status to the Modality Performed Procedure Step SOP Class SCP.

Behavior: The CS-7 executes the DIMSE services for SOP instances matching request attributes of the Modality Performed Procedure Step SOP Class.
The CS-7 recognizes the N-CREATE/N-SET response status and takes appropriate action depending on whether the service terminated normally or not.

DIMSE service request	Usage SCU/SCP
N-CREATE	M/M
N-SET	M/M

Modality Performed Procedure Step SOP Class (N-CREATE/N-SET/Final State Attribute)

Tag	Attribute Name	VR	VM	Required Type N-CREATE (SCU/SCP)	Required Type N-SET (SCU/SCP)	Required Type Final State
(0008,0005)	Specific Character Set	CS	1-n	1C/1C	1C/1C	
Performed Procedure Step Relationship						
(0040,0270)	Scheduled Step Attributes Sequence	SQ	1	1/1	Not Allowed	
>(0020,000D)	Study Instance UID	UI	1	1/1	Not Allowed	
>(0008,1110)	Referenced Study Sequence	SQ	1	2/2	Not Allowed	
>>(0008,1150)	Referenced SOP Class UID	UI	1	1C/1	Not Allowed	
>>(0008,1155)	Referenced SOP Instance UID	UI	1	1C/1	Not Allowed	
>(0008,0050)	Accession Number	SH	1	2/2	Not Allowed	
>(0040,1001)	Requested Procedure ID	SH	1	2/2	Not Allowed	
>(0032,1060)	Requested Procedure Description	LO	1	2/2	Not Allowed	
>(0040,0009)	Scheduled Procedure Step ID	SH	1	2/2	Not Allowed	
>(0040,0007)	Scheduled Procedure Step Description	LO	1	2/2	Not Allowed	
>(0040,0008)	Scheduled Protocol Code Sequence	SQ	1	2/2	Not Allowed	
>>(0008,0100)	Code Value	SH	1	1C/1	Not Allowed	
>>(0008,0102)	Coding Scheme Designator	SH	1	1C/1	Not Allowed	
>>(0008,0103)	Coding Scheme Version	SH	1	3/3	Not Allowed	
>>(0008,0104)	Code Meaning	LO	1	3/3	Not Allowed	
>>	All other attributes from the Scheduled Protocol Code Sequence			3/3	Not Allowed	
>(0040,2016)	Placer Order Number/Imaging Service Request	LO	1	3/3	Not Allowed	
>(0040,2017)	Filler Order Number/Imaging Service Request	LO	1	3/3	Not Allowed	
>(0032,1064)	Requested Procedure Code Sequence	SQ	1	3/3	Not Allowed	
>>(0008,0100)	Code Value	SH	1	1/1	Not Allowed	
>>(0008,0102)	Coding Scheme Designator	SH	1	1/1	Not Allowed	
>>(0008,0103)	Coding Scheme Version	SH	1	3/3	Not Allowed	
>>(0008,0104)	Code Meaning	LO	1	1/1	Not Allowed	
(0010,0010)	Patient's Name	PN	1	2/2	Not Allowed	
(0010,0020)	Patient ID	LO	1	2/2	Not Allowed	

(0010,0030)	Patient's Birth Date	DA	1	2/2	Not Allowed	
(0010,0040)	Patient's Sex	TM	1	2/2	Not Allowed	
(0008,1120)	Referenced Patient Sequence	SQ	1	2/2	Not Allowed	
>(0008,1150)	Referenced SOP Class UID	UI	1	1C/1	Not Allowed	
>(0008,1155)	Referenced SOP Instance UID	UI	1	1C/1	Not Allowed	
(0038,0060)	Service Episode ID	LO	1	3/3	Not Allowed	
(0038,0062)	Service Episode Description	LO	1	3/3	Not Allowed	

Performed Procedure Step Information						
(0040,0253)	Performed Procedure Step ID	SH	1	1/1	Not Allowed	
(0040,0241)	Performed Station AE Title	AE	1	1/1	Not Allowed	
(0040,0242)	Performed Station Name	SH	1	2/2	Not Allowed	
(0040,0243)	Performed Location	SH	1	2/2	Not Allowed	
(0040,0244)	Performed Procedure Step Start Date	DA	1	1/1	Not Allowed	
(0040,0245)	Performed Procedure Step Start Time	TM	1	1/1	Not Allowed	
(0040,0252)	Performed Procedure Step Status	CS	1	1/1	3/1	
(0008,1032)	Procedure Code Sequence	SQ	1	2/2	3/2	
>(0008,0100)	Code Value	SH	1	1C/1	1C/1	
>(0008,0102)	Coding Scheme Designator	SH	1	1C/1	1C/1	
>(0008,0103)	Coding Scheme Version	SH	1	3/3	3/3	
>(0008,0104)	Code Meaning	LO	1	3/3	3/3	
(0040,0250)	Performed Procedure Step End Date	DA	1	2/2	3/1	1
(0040,0251)	Performed Procedure Step End Time	TM	1	2/2	3/1	1
(0040,0254)	Performed Procedure Step Description	LO	1	2/2	3/2	
(0040,0255)	Performed Procedure Type Description	LO	1	2/2	3/2	
Image Acquisition Results						
(0008,0060)	Modality	CS	1	1/1	Not Allowed	
(0020,0010)	Study ID	SH	1	2/2	Not Allowed	
(0040,0260)	Performed Protocol Code Sequence	SQ	1	2/2	3/2	
>(0008,0100)	Code Value	SH	1	1C/1	1C/1	
>(0008,0102)	Coding Scheme Designator	SH	1	1C/1	1C/1	
>(0008,0103)	Coding Scheme Version	SH	1	3/3	3/3	
>(0008,0104)	Code Meaning	LO	1	3/3	3/3	
(0040,0340)	Performed Series Sequence	SQ	1	2/2	3/1	1
>(0008,1050)	Performing Physician's Name	PN	1-n	2C/2	2C/2	2
>(0008,1070)	Operator's Name	PN	1-n	2C/2	2C/2	2
>(0020,000E)	Series Instance UID	UI	1	1C/1	1C/1	1
>(0008,1140)	Referenced Image Sequence	SQ	1	2C/2	2C/2	
>>(0008,1150)	Referenced SOP Class UID	UI	1	1C/1	1C/1	
>>(0008,1155)	Referenced SOP Instance UID	UI	1	1C/1	1C/1	
>(0018,1030)	Protocol Name	LO	1	1/1	1/1	1
>(0008,103E)	Series Description	LO	1	2/2	2/2	2
>(0008,0054)	Retrieve AE Title	AE	1-n	2/2	2/2	2
>(0040,0220)	Reference Non-Image Composite SOP Instance Sequence	SQ	0-n	2/2	2/2	
>>(0008,1150)	Referenced SOP Class UID	UI	1	1/1	1/1	
>>(0008,1155)	Referenced SOP Instance UID	UI	1	1/1	1/1	
>	All other attributes from Performed Series Sequence			3/3	3/3	

Radiation Dose						
(0018,1110)	Distance Source to Detector	DS	1	3/3	3/3	
(0040,0306)	Distance Source to Entrance	DS	1	3/3	3/3	
(0040,0302)	Entrance Dose	US	1	3/3	3/3	
(0040,8302)	Entrance Dose in mGy	DS	1	3/3	3/3	
(0040,0303)	Exposed Area	US	1-2	3/3	3/3	
(0018,115E)	Image and Fluoroscopy Area Dose Product	DS	1	3/3	3/3	
(0040,030E)	Exposure Sequence	SQ	1	3/3	3/3	
>(0018,115A)	Exposure Mode	CS	1	3/3	3/3	
>(0018,0060)	KVP	DS	1	3/3	3/3	
>(0018,8151)	X-ray Tube Current in μA	DS	1	3/3	3/3	
>(0018,1150)	Exposure Time	IS	1	3/3	3/3	
>(0018,1160)	Filter Type	LO	1	3/3	3/3	
>(0018,7050)	Filter Material	CS	1	3/3	3/3	
	All attributes from Radiation Dose Module			3/3	3/3	
Billing Code and Material Management Code						
	All attributes from Billing and Material Code Module			3/3	3/3	

* The exposure sequence can only be output when connected to an X-ray generator.

3.5 Verification Service Class SCU Specifications

The CS-7 supports the following SOP classes as Verification Service Class SCU.

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1

3.5.1 Association Establishment Policies

3.5.1.1 General

The CS-7 Verification Service Class SCU recognizes and uses the following application context name.

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

The initial and maximum PDU size is 64 KB.

3.5.1.2 Number of Associations

The CS-7 Verification Service Class SCU issues a single association request at one time for the external AE that is implemented as a separate device.

3.5.1.3 Asynchronous Nature

Asynchronous processing is not supported.

3.5.1.4 Implementation Identifying Information

Description	Value
Implementation Class UID	1.2.392.200036.9107.307
Implementation Version Name	KM_CS7_1.00

3.5.2 Real World Activities

3.5.2.1 Associated Real World Activity

The relevant activity of the CS-7 Verification Service Class SCU in the real world where an association has been established is issuing a Verification request to the Remote Verification Service Class SCP, to verify application level communication.

3.5.2.2 Presentation Context Tables

The CS-7 verification Service Class SCU performs requests with the following Presentation Contexts.

Abstract syntax			
Name	UID	Role	Extended Negotiation
Verification SOP Class	1.2.840.10008.1.1	SCU	None

Transfer syntax	
Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2

3.5.2.3 Verification SOP Class

This model conforms with the Verification SOP Class.
The CS-7 uses C-ECHO to verify application level communication to the Verification Service Class SCP.

Behavior: The CS-7 executes the DIMSE services for SOP instances matching request attributes of the Verification SOP Class.
The CS-7 recognizes the C-ECHO response status and takes appropriate action depending on whether the service terminated normally or not.

CS-7 Verification Service Class SCU will behave as described in the Table below when recieve the C-ECHO response command message.

Status	Meaning	Code	Behavior
Success	The C-ECHO request is accepted.	0000	CS-7 Verification Service Class SCU AE recognized Verification Service Class SCP AE is present and working on the network.
*	*	Any other status code.	CS-7 Verification Service Class SCU AE recognized Verification Service Class SCP AE is not present or not working on the network.

3.6 Storage Commitment Service Class SCU Specifications

The CS-7 supports the following SOP classes as Storage Commitment Service Class SCU.

SOP Class Name	SOP Class UID
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1

3.6.1 Association Establishment Policies

3.6.1.1 General

The CS-7 Storage Commitment Service Class SCU recognizes and uses the following application context name.

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

The initial and maximum PDU size is 64 KB.

3.6.1.2 Number of Associations

The CS-7 Storage Commitment Service Class SCU issues a single association request at one time for the external AE that is implemented as a separate device.

3.6.1.3 Asynchronous Nature

Asynchronous processing is not supported.

3.6.1.4 Implementation Identifying Information

Description	Value
Implementation Class UID	1.2.392.200036.9107.307
Implementation Version Name	KM_CS7_1.00

3.6.2 Real World Activities

3.6.2.1 Associated Real World Activity

The relevant activity of the CS-7 Storage Commitment Service Class SCU in the real world where an association has been established is issuing an N-ACTION as storage commitment request to the Remote Storage Commitment Service Class SCP. And receive N-EVENT-REPORT as storage commitment result from the Remote Storage Commitment Service Class SCP.

3.6.2.2 Presentation Context Tables

The CS-7 Storage Commitment Service Class SCU performs requests with the following Presentation Contexts.

Abstract syntax			
Name	UID	Role	Extended Negotiation
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	SCU	None

Transfer syntax	
Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1

3.6.2.3 Storage Commitment Push Model SOP Class

This model conforms with the Storage Commitment Push Model SOP Class.
The CS-7 uses N-ACTION/N-EVENT-REPORT to request storage commitment to the Storage Commitmen Service Class SCP, and recive storage commitment result from the Storage Commitmen Service Class SCP.

Behavior: For SOP instances matching the Storage Commitment Push Model SOP Class, the CS-7 executes the N-ACTION/N-EVENT-REPORT DIMSE service.
The CS-7 recognizes the N-ACTION response status and N-EVENT-REPORT request status then takes appropriate action depending on whether the service terminated normally or not.

DIMSE service request	Usage SCU/SCP
N-EVENT-REPORT	M/M
N-ACTION	M/M

Storage Commitment request attribute list (N-ACTION)

Tag	Attribute Name	VR	VM	TYPE (SCU/SCP)
(0008, 1195)	Transaction UID	UI	1	1/1
(0008, 1199)	Referenced SOP Sequence	SQ	1	1/1
＞(0008, 1150)	Referenced SOP Class UID	UI	1	1/1
＞(0008, 1155)	Referenced SOP Instance UID	UI	1	1/1

Storage Commitment success result attribute list (N-EVENT-REPORT)

Tag	Attribute Name	VR	VM	TYPE (SCU/SCP)
(0008, 1195)	Transaction UID	UI	1	-/1
(0008, 1199)	Referenced SOP Sequence	SQ	1	-/1
＞(0008, 1150)	Referenced SOP Class UID	UI	1	-/1
＞(0008, 1155)	Referenced SOP Instance UID	UI	1	-/1

Storage Commitment fail result attribute list (N-EVENT-REPORT)

Tag	Attribute Name	VR	VM	TYPE (SCU/SCP)
(0008, 1195)	Transaction UID	UI	1	-/1
(0008, 1199)	Referenced SOP Sequence	SQ	1	-/1C
＞(0008, 1150)	Referenced SOP Class UID	UI	1	-/1
＞(0008, 1155)	Referenced SOP Instance UID	UI	1	-/1
(0008, 1198)	Failed SOP Sequence	SQ	1	-/1
＞(0008, 1150)	Referenced SOP Class UID	UI	1	-/1
＞(0008, 1155)	Referenced SOP Instance UID	UI	1	-/1
＞(0008, 1197)	Failure Reason	US	1	-/1

4 Communication Profiles

4.1 Supported Communication Stacks

CS-7 provides the TCP/IP network communication support defined by the DICOM3.0 PART8.

4.2 TCP/IP Stack

The TCP/IP stack is inherited from the Windows system environment.

4.2.1 Physical Media Support

For using TCP/IP, 100BASE-TX and 1000BASE-T are supported as standard.

4.2.2 IPv4 and IPv6 Support

This product only supports IPv4 connections.

5 Extensions/Specializations/Privatizations

Basic Film Box and Printer Attributes (2011,1000) are handled as Private Data.
CR/DX image IOD (0031,1000) are handled as Private Data.
However, these are transferred if required.

6 Configuration

6.1 Print Management Service Class SCU

6.1.1 Configurable Parameters

The following are configurable parameters.

Item	Contents
IP address	IP address of SCP
Port number	Port number of SCP
Calling AE Title	Application title of CS-7
Called AE Title	Application title of SCP

6.2 Storage Service Class SCU

6.2.1 Configurable Parameters

The following are configurable parameters.

Item	Contents
IP address	IP address of SCP
Port number	Port number of SCP
Calling AE Title	Application title of CS-7
Called AE Title	Application title of SCP

6.3 Basic Worklist Management Service Class SCU

6.3.1 Configurable Parameters

The following are configurable parameters.

Item	Contents
IP address	IP address of SCP
Port number	Port number of SCP
Calling AE Title	Application title of CS-7
Called AE Title	Application title of SCP

6.4 Study Management Service Class SCU

6.4.1 Configurable Parameters

The following are configurable parameters.

Item	Contents
IP address	IP address of SCP
Port number	Port number of SCP
Calling AE Title	Application title of CS-7
Called AE Title	Application title of SCP

6.5 Verification Service Class SCU

6.5.1 Configurable Parameters

The following parameters are configurable.

Item	Contents
IP address	IP address of SCP
Port number	Port number of SCP
Calling AE Title	Application title of CS-7
Called AE Title	Application title of SCP

6.6 Storage Commitment Service Class SCU

6.6.1 Configurable Parameters

The following parameters are configurable.

N-ACTION

Item	Contents
IP address	IP address of SCP
Port number	Port number of SCP
Calling AE Title	Application title of CS-7
Called AE Title	Application title of SCP
N-ACTION requet delay time	Wait time (hour) from receiving C-SORE RSP to sending N-ACTION REQ

N-EVENT-REPORT

Item	Contents
Port number	Port number of CS-7
Timeout time	Wait time (days) from send N-ACTION to receive N-EVENT-REPORT

7 Support of Extended Character Sets

The VR provides support for extended characters in SH (short string), LO (long string), ST (short text), LT (long text), and PN (person name) by specifying an extended character repertoire for the Attribute Specific Character Set (0008,0005) in each Service Class. The supported extended character repertoire is as follows.

- ISO_IR 100
- ISO_IR 101
- ISO_IR 109
- ISO_IR 110
- ISO_IR 148
- ISO_IR 144
- ISO_IR 126
- ISO_IR 138
- ISO_IR 166
- ISO_IR 192

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A47FEA01EN08
2020-01-28
(MA)